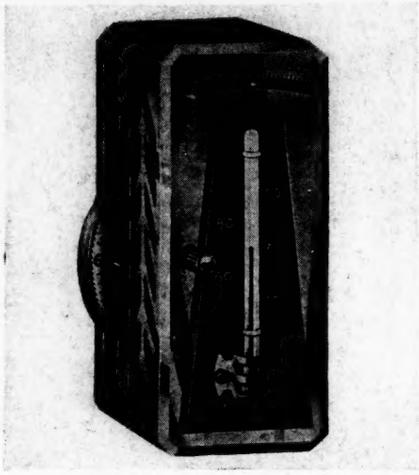
REGARDLESS of the size or type of automatic heating, ventilating or air conditioning system you install, there is a Minneapolis-Honeywell automatic control system for it. Each control system is selected to exactly meet the individual requirements of the installation. Be sure you include complete automatic Minneapolis-Honeywell controls on every job. They are your assurance that the system will function at its best, with the greatest efficiency, economy and trouble free performance. The Minneapolis-Honeywell Engineer in or near your city is available for consultation at all times. Call him in. Minneapolis-Honeywell Regulator Company, 2715 Fourth Avenue South, Minneapolis, Minnesota . . . Branch and distributing offices located in all principal cities.



Mercoid Sensatherm

NAME—Mercoid Day-Night Sensatherm.

PURPOSE—A day and night thermostat.

FEATURES—This instrument combines in one unit the well known Mercoid standard Sensatherm with a specially designed hand-wound timer mechanism. The timing mechanism can be set for any period up to a 9-hr. interval. A calibrated dial on the side indicates the time interval for which the instrument is set. It is said that the Sensatherm will hold the temperature to within a total differential of 1F of any predetermined setting. The standard range is 55 to 85F.

LITERATURE AVAILABLE—Bulletin D-16.

MADE BY—*The Mercoid Corp., Chicago.*

Bell & Gossett Controls

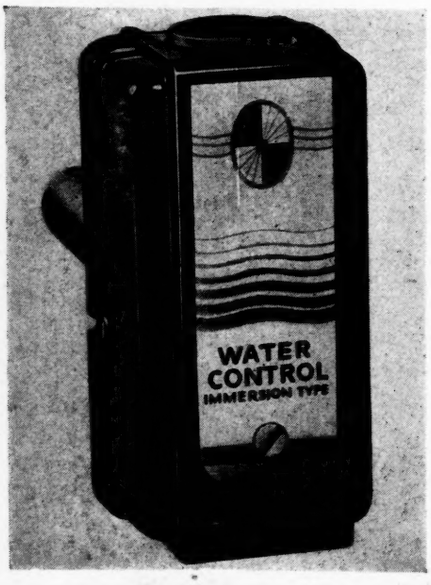
NAME—Bell & Gossett electrical controls.

PURPOSE—Control of water heaters and heating systems.

FEATURES—This line of controls includes thermostats, hot water controls, pressure controls, fan controls and relays. All of the limit controls employ a twin contact switch mechanism. Magnetic acceleration is employed so that snap action is insured on both opening and closing of the contact.

LITERATURE AVAILABLE—Bulletin CTP-1037.

MADE BY—*Bell & Gossett Co., 3000 Wallace St., Chicago, Ill.*



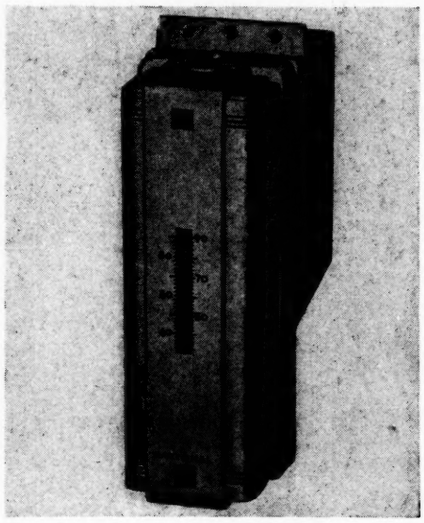
M-H Pneumatic Thermostat

NAME—Pneumatic Submaster room thermostat.

PURPOSE—For regulating temperatures in a room with relationship to conditions at another point. Can be used with all types of heating and cooling equipment where graduated control by compressed air is desired.

FEATURES—Thermostat will control the temperature in a room in accordance with the conditions at some other point. In the summer, for example, this thermostat will, when under the regulation of a master controller placed at an outside location, raise the inside temperature from 72 to 82F as the outdoor temperature rises from 70 to 100F. All moving parts operate in a sealed chamber.

METHOD OF OPERATION—A pipe line leads from the master controller to a bellows arrangement on the back of the submaster thermostat. Increasing or decreasing the air pressure in this bellows mechanically changes the setting of the Submaster indicator. A simple switch-over arrangement is provided so that the Submaster feature can be disconnected and the thermostat will operate as a conventional room thermostat. The scale range is from 46 to 90F with scale markings every four degrees.



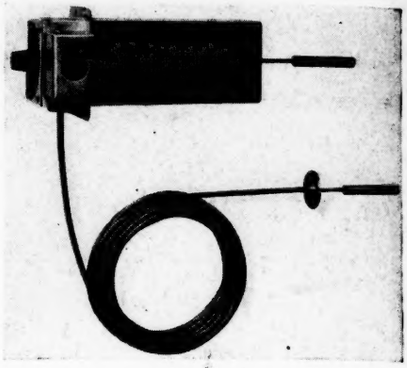
MADE BY—*Minneapolis-Honeywell Regulator Co., National Regulator Division, Minneapolis, Minn.*

Automatic Duct Temperature Controllers

NAME AND MODEL NUMBER—Duct temperature controllers, type LD-2.

PURPOSE—To maintain a balance between the return air and discharge air temperatures in air conditioning and heating applications in order to prevent sudden changes in discharging first cold and then hot blasts of air.

FEATURES—Main control thermal element is affected by the return air temperature. This helps the discharge air thermal element (each compensating the other) to find the correct discharge air temperature and to maintain the desired return air temperature from its two control locations. Temperature changes are transmitted by the use of a Bourdon tube operating pure silver contacts. The Bourdon tube is incorporated in the main control head and adjusts itself to the constant air temperature changes. The thermal control element extending from the Bourdon control tube head transmits any small change of temperature immediately to the tube causing the control instrument to respond to slight temperature variations. Discharge air thermal element is equipped with 22 ft. of capillary armored tubing and return air control and discharge thermal control are equipped with flanges for mounting on ducts.



TYPES AVAILABLE—Series 20, high and low voltage; series 30, positive and floating action; and series 40, modulating control.

MADE BY—*Automatic Temperature Control, Inc., 101 Park Ave., New York.*

Paragon Time Switches

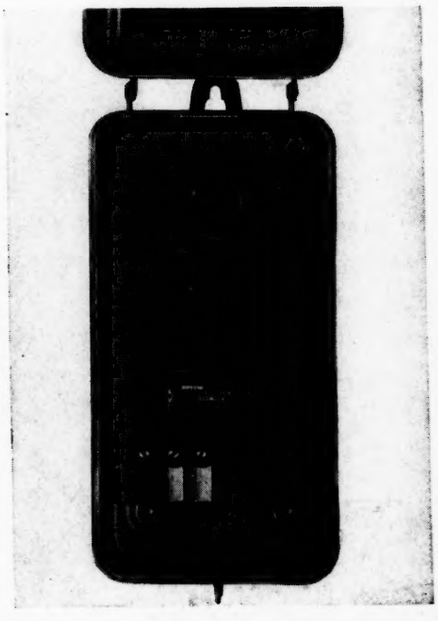
NAME—Paragon synchronous time switches.

PURPOSE—Time switches for either outdoor or indoor installation.

FEATURES—These new models of time switches have two improvements over the old models. The first improvement is a change in the case design. The new cases are drawn from 16 gage steel and are seamless. An interlocking joint between the shallow cover and the deeper base is made tight by a continuous cork gasket. The indoor models are finished in satin black lacquer with chromium hinge and hasp while the outdoor type is finished in weatherproof aluminum bronze and is fitted with a window to check operation without opening. The second improvement consists of a "clear-line" dial and trip assembly. There are two dial knobs, one frees or locks the dial to a frictionless arbor. When set at a fixed time there is no chance for slipping so that the instrument cannot build up a time-offage. The other dial knob frees or locks the adjustable switch trippers.

LITERATURE AVAILABLE—Bulletin 3743.

MADE BY—*Paragon Electric Co., 37 W. Van Buren St., Chicago.*



Windowstat†

†Prevents condensation on windows

Remote Humidity and Temperature Recorder

Portable Recorder

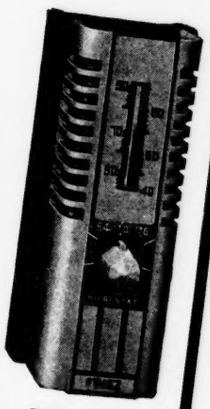
Humidistat

A gallery of Controls and Precision Instruments each wearing the hall mark of uniqueness and extremest value for special and important needs of Air Conditioning. Exclusive products designed and manufactured by Julien P. Friez & Sons, Inc. If you are not familiar with them, write for complete catalogue. For latest models, showing improvements in case design and many other refinements, visit our Booth No. 49 at the January Show in New York. Mark your Friez visit high up on your list of musts.

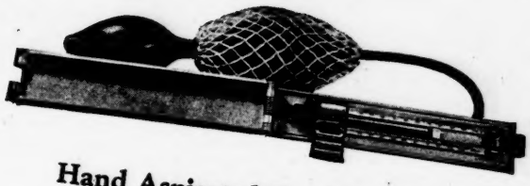
JULIEN P. FRIEZ & SONS
INCORPORATED
BALTIMORE MARYLAND

Comfortrol‡

‡Provides Effective Temperature

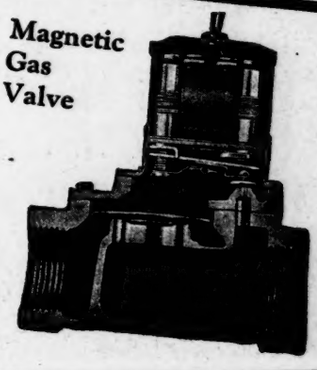


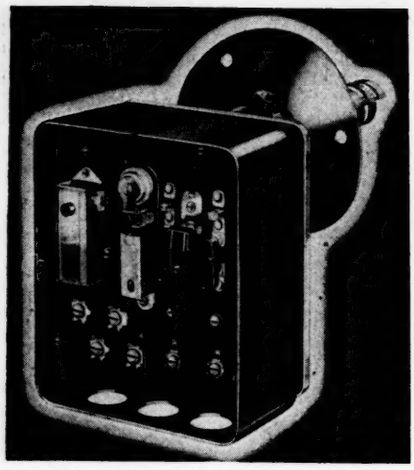
Microstat



Hand Aspirated Psychrometer

Magnetic Gas Valve





Penn Stack Controls

NAME AND MODEL NUMBER—Penn Saftrols, type 670 (continuous ignition) and type 672 (intermittent ignition).

PURPOSE—Stack safety combustion controls for a.c. service on all types of oil burners.

FEATURES—These controls, which are completely restyled both externally and internally, incorporate all the features formerly available in the Penn stack switch line. In addition they offer voltage protection, a feature which is said to give positive automatic shutdown of the burner to guard against ignition failure in the event of subnormal voltages in the supply line.

CAPACITY—One horsepower single phase at 110 volts.

MADE BY—*Penn Electric Switch Co., Goshen, Ind.*

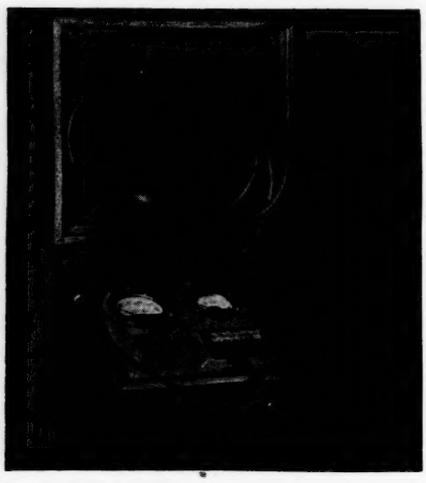
Hebler Fuel Ratiometer

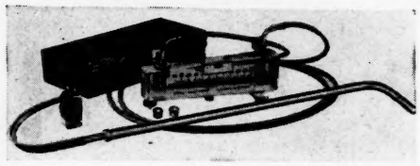
NAME—Hebler fuel ratiometer.

PURPOSE—For checking carbon dioxide percentage and stack temperature of coal-, gas-, and oil-fired boilers.

FEATURES—The fuel ratiometer is composed of an instrument which utilizes the thermal conductivity principle for measuring carbon dioxide combined with another instrument which uses the thermo electric principle for measuring stack temperature. These two instruments have been combined into a portable apparatus. A hand aspirator is provided with each instrument together with a combination thermocouple and gas sampling holder. The temperature indicating instrument is calibrated for a range of 100 to 1000F, and the gas gage from 0 to 20% carbon dioxide.

MADE BY—*Wm. O. Hebler Co., 830 Broad St., Newark, N. J.*





Friez Air Meters

NAME—Friez air meter set.

PURPOSE—To give easy readings of static pressures, velocities, air volumes and drafts.

FEATURES—Complete outfit is made up of a gage, tubing, fittings, oil and data sheets in a stiff carrying case. A unique feature of the meter is the chromium plated and highly polished graduated scale which reflects the image of the liquid column through the transparent Bakelite body of the instrument. This is said to completely eliminate the error from parallax. A built-in level with adjustment and a scale adjustment are incorporated in the instrument.

CAPACITIES—Various ranges are available covering velocities from 400 to 8000 f.p.m. and pressures or vacuums from 0.005 in. of water up to 4.0 in. of water.

MADE BY—*Julien P. Friez & Sons, Inc., Baltimore, Md.*

Square D Float Switch

NAME AND MODEL NUMBER—Screw-in tank float switch, Class No. 9137, types FB1 and FB3.

PURPOSE—For control of pumps regulating liquid level.

FEATURES—Switches are complete units in themselves and are composed of the switch mechanism, cadmium-plated brass float, linkage for transmitting the movement of the float to the switch mechanism, and a screw-in connection. Float travel adjustments can be made on the outside of the tank and can be sealed. The graphite-coated asbestos packing used is suitable for steam, hot or cold water and oil, where the tank pressure does not exceed 50 lb. per sq. in.

MADE BY—*Square D Co., Regulator Division, Detroit, Mich.*

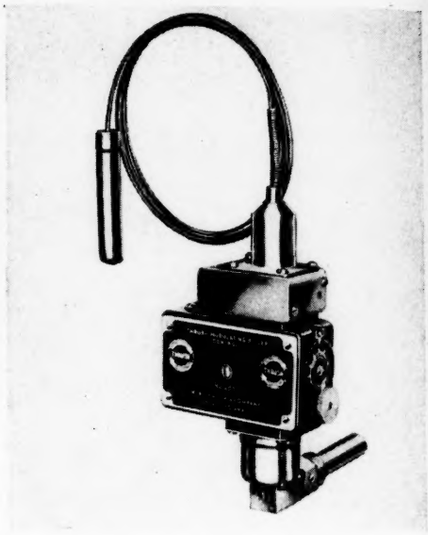
Thrush Boiler Water Control

NAME AND MODEL NUMBER—Thrush modulating boiler water control No. 203.

PURPOSE—A boiler control for hot water heating systems which automatically raises or lowers the temperature of the water to meet the demands placed on the heating system.

FEATURES—For most satisfactory results this control should be used in connection with the No. 201 Thrush radiant heat control, water circulator, and flow control valve. This modulating boiler water temperature control maintains any desired minimum boiler temperature to provide domestic hot water in summer or winter. When more heat is necessary the boiler water temperature is automatically raised. The manufacturer claims substantial fuel savings due to the fact that on all high temperature installations where it is usually necessary to set the boiler control to maintain 210F throughout the heating season, with this new type of instrument the 210F is maintained only during the peak load season and lower temperatures are carried through the rest of the season.

METHOD OF OPERATION—When used with a system providing domestic hot water the boiler control operates to maintain the boiler water temperature at the dial setting providing the room thermostat does not call for heat. If, however, the room thermostat calls for heat at frequent intervals, indicating that the outdoor temperature is low, the radiator and the return line temperature will rise because of the frequent operation of the circulator. The feeler bulb which is clamped to the return line now comes into play and



automatically raises the operating temperature of the boiler control. Thus the temperature of the return line is used to indicate changes of outdoor temperature and automatically raises or lowers the boiler water temperature sufficiently to meet the heating demands. In mild weather when the radiator and return line temperatures are kept low, because of the operation of the control, the boiler temperature can be maintained between 155F and 165F. In colder weather the radiator and return line temperatures will increase and the boiler temperature will also increase, always being maintained about 20F higher than the return line temperature. The maximum boiler temperature adjustment which can be reached is limited by the control to a temperature of approximately 230F so that the boiler temperature cannot rise to the dangerous point.

MADE BY—*H. A. Thrush & Co., Peru, Ind.*

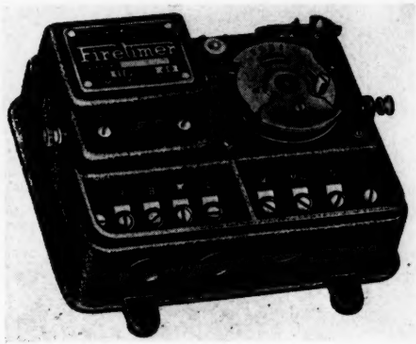
Fairbanks-Morse Fire-Timer

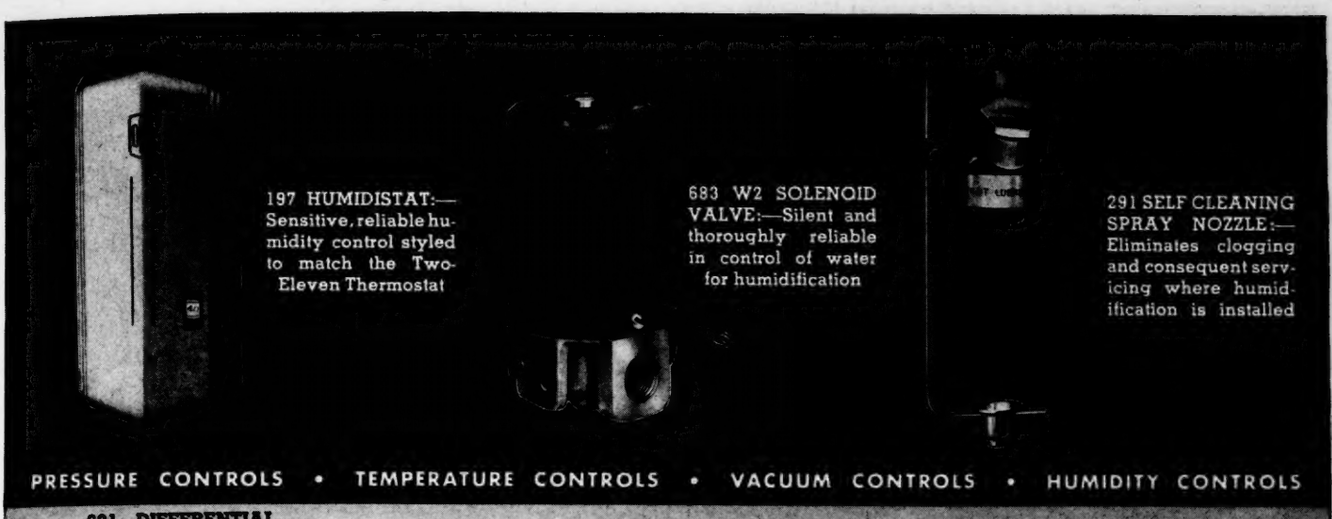
NAME—Fairbanks-Morse Fire-Timer.

PURPOSE—For controlling stokers.

FEATURES—This new device is said to prevent losing fire during even the mildest spring or fall weather by automatically operating the stoker for brief periods at predetermined intervals. Timer can be set to operate either at hour and half-hour intervals or any desired period of time. Although independent of thermostatic control, the Fire-Timer is said to be coordinated with it to avoid excessive burning. Should the timer normally start the burner just following a period of operation by the thermostat, this period is missed and the burner is not started until the predetermined interval later. The device is completely enclosed in an attractive black metal case. Available only with the Fairbanks-Morse stoker.

MADE BY—*Fairbanks, Morse & Co.*, 900 *S. Wabash, Chicago.*





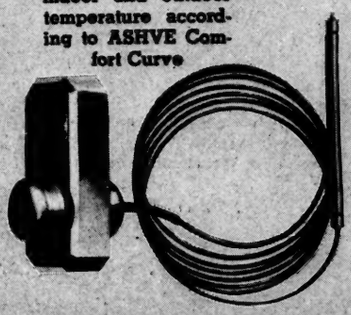
197 HUMIDISTAT:—Sensitive, reliable humidity control styled to match the Two-Eleven Thermostat

683 W2 SOLENOID VALVE:—Silent and thoroughly reliable in control of water for humidification

291 SELF CLEANING SPRAY NOZZLE:—Eliminates clogging and consequent servicing where humidification is installed

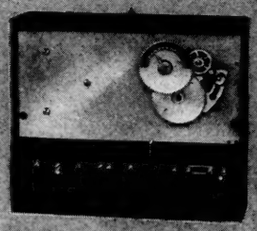
PRESSURE CONTROLS • TEMPERATURE CONTROLS • VACUUM CONTROLS • HUMIDITY CONTROLS

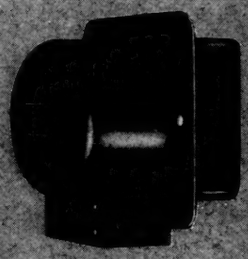
691 DIFFERENTIAL THERMOSTAT:—For Summer cooling, controls by the DIFFERENCE between indoor and outdoor temperature according to ASHVE Comfort Curve



431 MOTOR UNIT:—For Zone Control. Provides inexpensive means for individual control in zoned heating

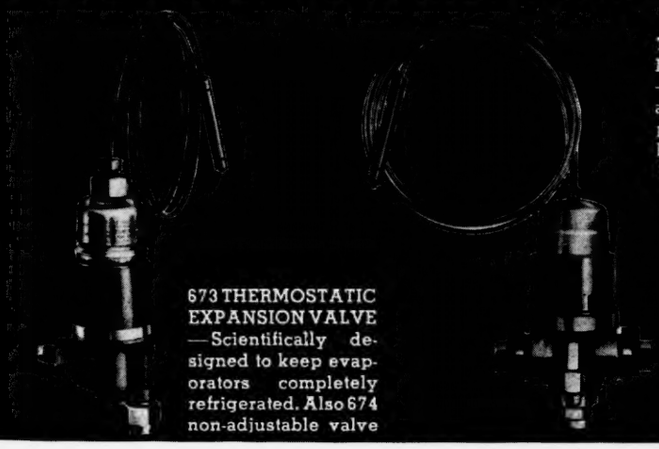
384 STOKER TIMER:—Control with relay-transformer as illustrated. Supplied also with hand safety switch and as timer only





298 RELAY TRANSFORMER:—Small compact combination of relay and transformer which operates silently

LOW WATER CUTOUTS • TRANSFORMERS • RELAYS • HEATING CONTROLS • REFRIGERATING CONTROLS



673 THERMOSTATIC EXPANSION VALVE—Scientifically designed to keep evaporators completely refrigerated. Also 674 non-adjustable valve

785 THERMOSTATIC EXPANSION VALVE—Large capacity for air conditioning—capacity up to 20 tons on Freon. Smaller sizes 10 tons and 6 tons

782 STRAINER:—Designed for use with large thermostatic valves or solenoids—bolts directly to valve flanges

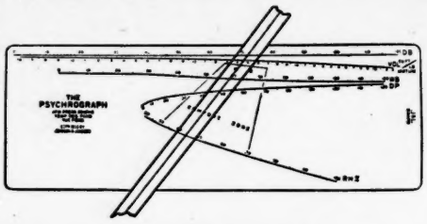
AVAILABLE AT LEADING JOBBERS THROUGHOUT THE COUNTRY

DETROIT LUBRICATOR COMPANY

5900 TRUMBULL AVENUE • DETROIT, MICH. U. S. A.

NEW YORK, NEW YORK—40 West 40th Street
CHICAGO, ILLINOIS—816 South Michigan Avenue

Canadian Representative—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, Montreal, Toronto, Winnipeg



J & J Psychrograph

NAME—The Psychrograph.

PURPOSE—For rapid psychrometric readings and calculations.

FEATURES—Instrument consists of a psychrometric graph combined with an indicating rule and is said to possess many advantages over the conventional type of psychrometric chart. Each psychrometric function, such as dry bulb, wet bulb, relative humidity, is represented by one curve and the chart has no intersecting lines. Values of dry bulb, wet bulb, dewpoint, specific volume and relative humidity can be easily read with one operation. On the back of the instrument are tables of total and latent heat per pound of mixture of air and water vapor. Instrument is made of heavy celluloid and is 3½ x 10½ in. in size.

METHOD OF OPERATION—Knowing any of the two following functions the remainder may be found by one simple operation. The functions are dry bulb, wet bulb, dewpoint, relative humidity, and specific volume. For instance, if we know the value of the dry bulb and wet bulb, it is merely necessary to place the indicating rule so that its line intersects the dry bulb and wet bulb curves at the values known. The intersection of the line on the indicating rule with the other curves will then show the values corresponding to the original conditions.

MADE BY—*J & J Graph, Villa Park, Ill.*

Minneapolis-Honeywell Da-Nite Acratherm

NAME—Minneapolis-Honeywell Da-Nite Acratherm.

PURPOSE—A thermostat and time control for automatically resetting manually lowered night temperatures.

FEATURES — This instrument combines the Acratherm and Time-O-Stat into one instrument. It is equipped with a black setting dial and winding knob for adjustment. The temperature setting can be made at any point as low as 45F by moving the indicator to the desired lower temperature scale. A dial lock screw is furnished to prevent tampering with the temperature setting. Thermometer is recessed to guard against breakage. Instrument is furnished with a detachable wall plate for mounting. The day scale range is from 55 to 85F and the night scale range from 45 to 75F.

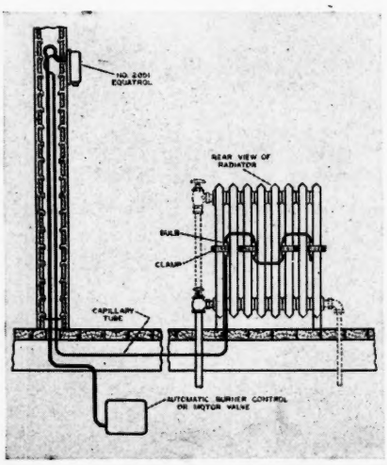
MADE BY—*Minneapolis-Honeywell Regulator Co., 2715 Fourth Ave., S., Minneapolis, Minn.*

Arco Thermostat

NAME—Arco Equatrol.

PURPOSE—A thermostat designed to eliminate stratification and uncomfortable lags in heat pick-up and at the same time to insure a constant supply of radiant heat. For use with steam, vapor, or vacuum heating systems and any type of automatic heating.

FEATURES—Thermostat is said to respond directly to radiator temperature as well as the temperature of the room. Four small bulbs, attached to four different sections of a radiator or convector to get the average radiator temperature, operate to keep the radiator always warm. Thus a constant air motion through convection currents as well as a constant supply of radiant heat is maintained. Room thermostat operates in the usual way while the radiator attachment, by keeping the radiator warm, is said to eliminate lag by calling for heat before the room temperature has dropped below the comfort point. The room thermostat bulb is built to operate on room temperature changes of 1/5F or plus or minus 1/10F while the radiator bulbs are operated on radiator temperature changes of 10F or plus or minus 5F. The new unit is wired and installed in the same manner as the low voltage room thermostat and is regularly furnished with 20 ft. of capillary tubing.



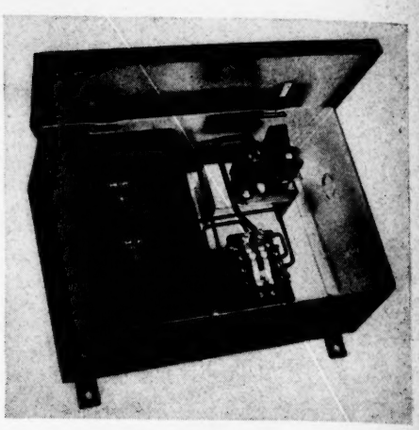
MADE BY—*American Radiator Co., 40 W. 40th St., New York.*

Spencer Stoker Timer

NAME—Klixon timer.

PURPOSE—For controlling the operation of stokers so as to maintain the fire.

FEATURES—The timer can be set to turn the heat on at intervals ranging from ½ to 1 hr. and can also be set to keep the heat on any length of time ranging from 2 min. to 7 min. These settings are entirely independent of each other. Another feature is a device for preventing the Timer from going on if the thermostat has been calling for heat and the fire has been built up. The Timer remains idle when the thermostat is functioning. Furthermore, the length of time that the Timer remains idle after the thermostat shuts off is automatically regulated in proportion to the length of time the thermostat has been calling for heat. If the thermostat has been calling for heat for a long period of time and the fire is built up to a high temperature, the Timer will remain idle longer than its set time to allow the fire sufficient time to cool down. If, on the other hand, the thermostat has been on for only a short time, the Timer's idle period is automatically shortened in order to eliminate all chances of the fire's going out. The manufacturer states that this unit is completely electric and has no clock mechanism or rotating parts. It is claimed that it can be used with practically any type of automatic stoker.



MADE BY—*Spencer Thermostat Co., Attleboro, Mass.*

Bailey-Parsons Therhumiter

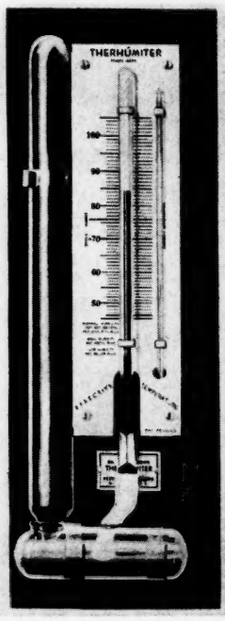
NAME—Bailey-Parsons Therhumiter.

PURPOSE—To indicate effective temperature.

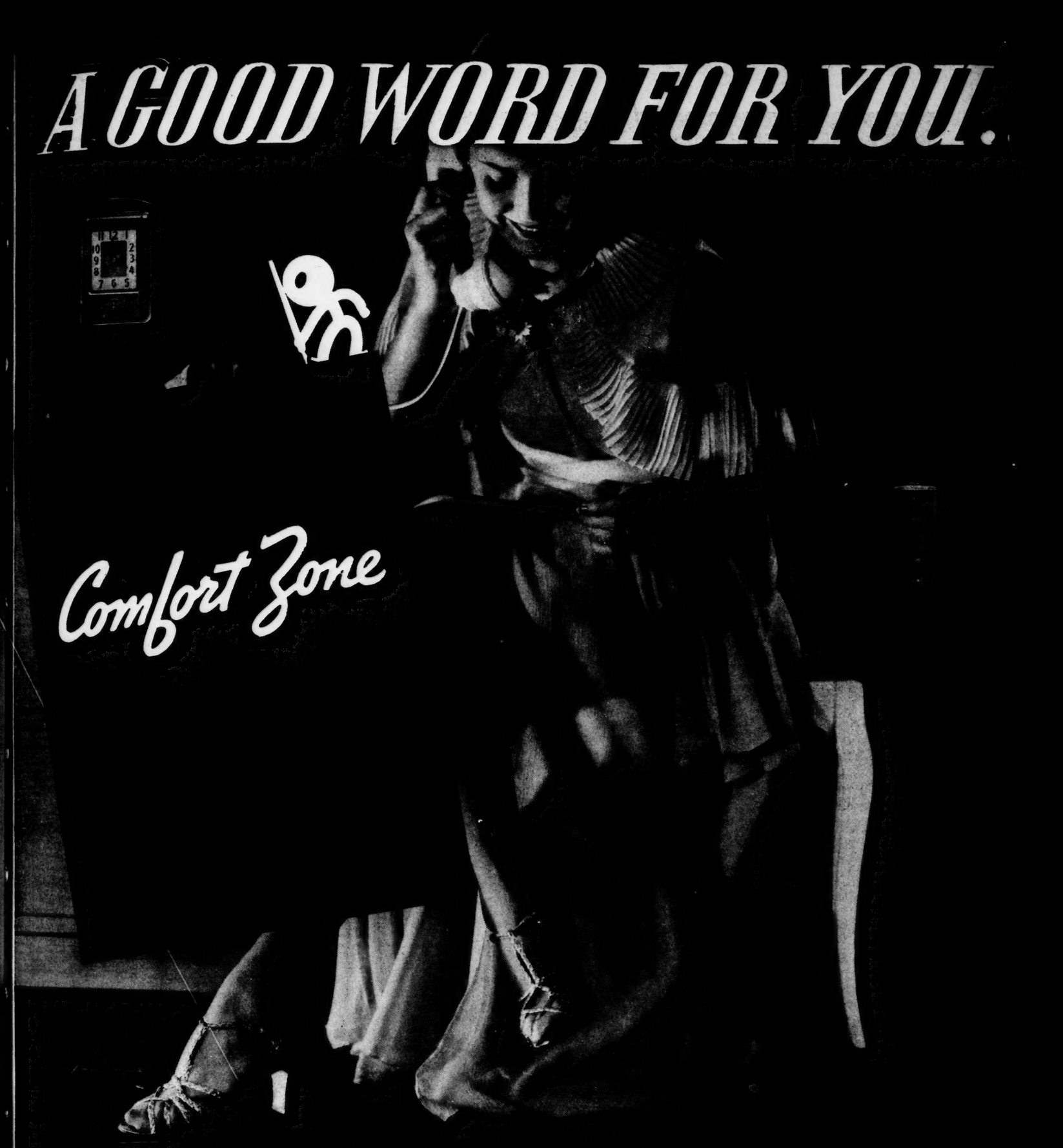
FEATURES—It is said that the Therhumiter will continuously register with permanent accuracy the effective temperature of room air. It is adjusted for air motion up to 150 f.p.m. There are no moving parts, the instrument consisting of a special type tube with two bulbs, one covered with a saturated cloth. A dry bulb thermometer is also supplied. Relative humidity can be calculated by the use of a simple formula printed on the instrument.

PRICE—$15.

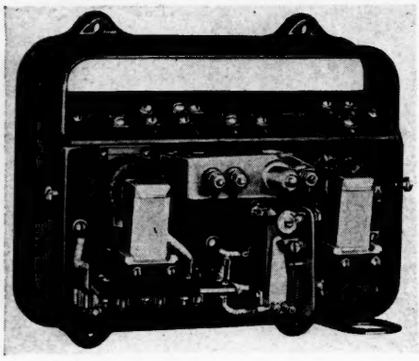
MADE BY—*John R. Parsons, 151 E. 19th St., New York.*



A GOOD WORD FOR YOU.



1938 PROFIT MEMO . . . Standardize on these Penn Controls . . . 1 Tem-Clock (Electric Day-Nite Timer). 2 Temtrol (Heat Anticipating Thermostat). 3 Saftrols (Safety Combustion Controls). 4 Stoker Relays. 5 Hot Water Limit Switches. 6 Steam Limit Switches. 7 Warm Air Limit Switches. 8 Furnace Fan Controls. 9 Circulator Controls. 10 Unit Heater Controls. 11 Heating and Cooling Thermostats. 12 Humidistats. 13 Gas Valves. 14 Water Valves. 15 Solenoid Valves. 16 General Purpose Relays. 17 Compressor Controls.



M-H Protectorelay

NAME AND MODEL NUMBER — Protectorelay, type R157A.

PURPOSE—A control system for industrial oil burners to give a timed sequence of burner operation.

FEATURES — This relay permits predetermined ignition timing, delayed opening of the oil valve, if required, and a timed scavenger or recycling period. Time switch is utilized for both ignition and oil valve as well as providing a timed delayed return to the cold position. The Protectorelay is also used with the type C56 Pyrostat to provide safe operation of the burner. This safety control overlaps on the heating cycle but not on the cooling cycle. The ignition switch timing is adjustable from 45 to 120 seconds; the delayed oil valve timing is 25 to 35 seconds, and safety switch timing from 80 to 100 seconds.

RATING — 10 amperes at 110 volts and 5 amperes at 220 volts.

MADE BY — *Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.*

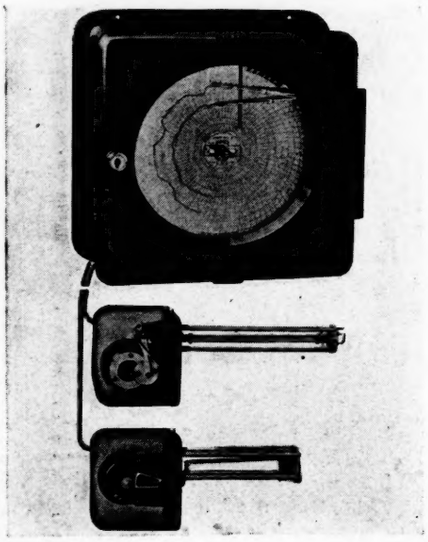
Friez Humidity and Temperature Recorders

NAME—Round chart recording instruments for relative humidity and temperature.

PURPOSE—For indicating relative humidity or temperatures.

FEATURES—Instruments are available in two types, one the self-contained type for recording conditions immediately surrounding the instrument and the other, remote or distance transmission type for indicating and recording conditions at a remote point. The self-contained types have the sensitive element and all mechanism contained within the recorder case, the whole being arranged for wall or panel mounting. The remote type instruments are available with either of two types of transmission, one with a capillary tube for short distances and the other with a synchronous electric transmission for distances over 25 ft. In the long distance transmission type the only connection required between the sensitive elements and the indicator is a low voltage 5 or 3 conductor wire. The manufacturer states that this is the first time that the transmission of relative humidity direct from remote distances has been available. Recorders for either daily or weekly operation are available. The standard instrument has an electric clock movement; spring wound clocks are available on special order. All recorders will handle humidity range from 0 to 100%. Various temperature ranges may also be covered. The standard is from 0 to 100F.

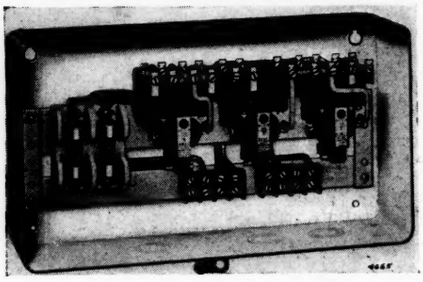
MADE BY—*Julien P. Friez & Sons, Inc., Baltimore, Md.*



Allen-Bradley Alternator

NAME—Automatic alternator pilot control panel.

PURPOSE — For automatically alternating duplex units such as refrigeration units, fans, compressors, pumps or motors where alternate operation of the units is desired.



FEATURES—In many duplex installations of equipment where two units are installed—one to carry the load and the other to be held in reserve for peak loads, it is customary to alternate the load between the two units to distribute wear. Although this control panel was developed primarily to operate duplex pump installations, it can also be used on any other duplex equipment installations as noted above. The panel is composed of three Allen-Bradley Bulletin 700 relays. Pilot control device which operates alternator may be a pressure switch, vacuum switch, thermostat, two-wire pushbutton, or float switch.

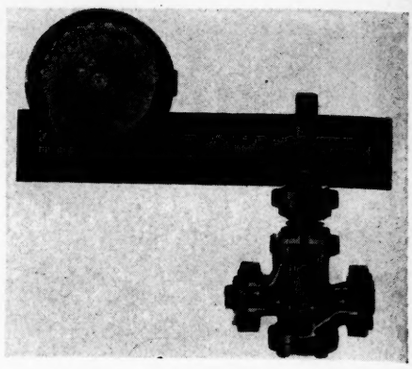
MADE BY—*Allen-Bradley Co., 1311 S. First St., Milwaukee, Wis.*

Brown Area Flow Meter

NAME—Brown area meter.

PURPOSE—For metering refrigerating fluids.

FEATURES—Manufacturer states that the instrument is well adapted to metering refrigerating fluids since measurement is not one of pressure differentials. The meter is of a constant head, variable orifice type. Pressure differential is held constant by balancing the weight of the piston against the pressure drop across an orifice which is contained in the meter body. The position of the piston is transmitted electrically by the inductance bridge principle to the indicator or recorder. The meter is connected into a pipe line like a valve and its range may be changed by the addition or removal of weights in the hollow piston. By this means, changes in the capacity of the meter of approximately 20% can be obtained. Further changes in capacity can be obtained by the installation of a new orifice sleeve which may be of bronze or stainless steel depending upon the nature of the fluid to be measured. A cast iron meter body is supplied for pressure up to 250 lb. and a cast-steel body for pressure up to 600 lb. The maximum temperatures must not exceed 600F. Meter can be supplied as an indicator, recorder, indicator-integrator, or recorder-integrator. An electrical transmitting system makes it possible to install the meter at a remote point from the meter body.



SIZES AND CAPACITIES—Furnished in one size only with 2 in. flanges. Based on water flow measurement, the minimum range is 150 gal. per hr. and the maximum 2000 gal. per hr. For other fluids the actual capacity is determined from the ratio of the square root of the density of the fluid compared to the square root of the density of water at the same temperature.

LITERATURE AVAILABLE—Catalog 2004.

MADE BY—*Brown Instrument Co., Division of Minneapolis-Honeywell Regulator Co., Philadelphia, Pa.*

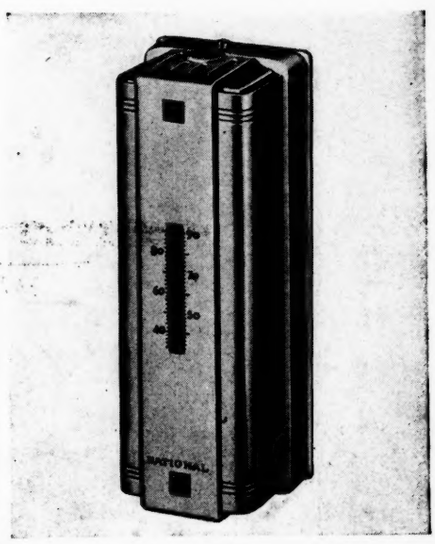
M-H Thermostats

NAME—National Helmet Sealed thermostat.

PURPOSE—Pneumatic thermostat for recording room temperatures.

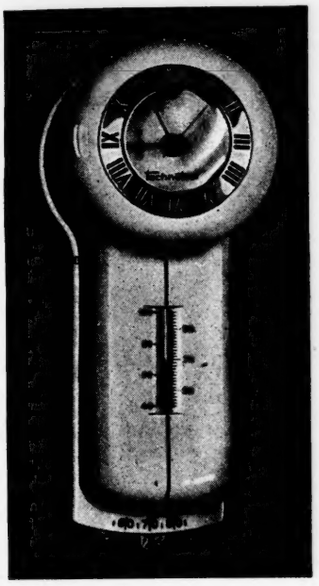
FEATURES—The outside appearance of the line of pneumatic thermostats has been changed by using a modern case designed along the lines of the other M-H thermostats. All moving parts operate in a sealed chamber to prevent foreign substances from interfering with the operation of the control. National's thermostatic element of ebonite has been retained. The overall size of the instrument has been reduced and the thermometer has been recessed for protection. The temperature range of the new thermostat is from 46 to 90F.

MADE BY—*Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.*



MASTER HEAT REGULATOR

Whether you are a contractor, jobber, or engineering executive, you get the best and save the most with MASTER PRODUCTS. Sturdily constructed of finest materials – built by experts – backed by over twenty years of growing success in the heat regulator field. Master builds in accuracy and long life, and offers these instruments at the lowest possible price for which such quality and service can be purchased.



Technotrol

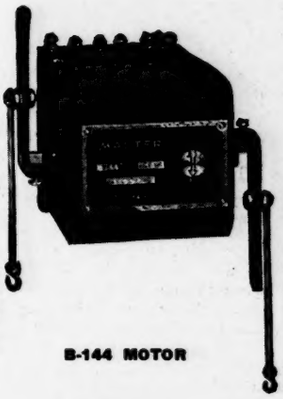
Furnished in Ivory or black molded cases, Technotrol combines distinctive beauty with a fine instrument of precision. Responsive to minute changes in temperature. Technotrol is available in either the Type C-22 two-position model or the famous Type C-144 gradual control model. Also furnished with snap action contacts for 2 or 3 wire low voltage control systems.

B-144
PLAIN MODEL

TYPE B-144

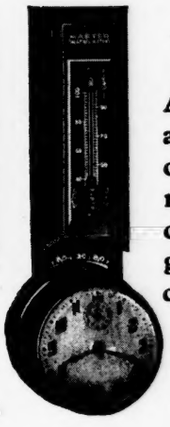
GRADUAL CONTROL

An instrument of precision, performance and long life, it has four-position smoothness together with the unequalled sensitiveness of Master's patented Thermo-Wafer. Contacts are platinum-iridium. Special non-inductive thermal starting switch requires less than 3 watts. The four-pole induction motor operates at 16 volts through a special low-reactance type of transformer. Listed as standard by Underwriters' Laboratories.



B-144 MOTOR

B-22
PLAIN MODEL



ONE-DAY
CLOCK MODEL

TYPE B-22

TWO POSITION

A MASTER instrument with the appearance, accuracy and reliability characteristic of the entire line. Priced for the greatest market of all – moderate salaried home owners. Has fine silver contacts, and 1 degree temperature range response. Motor is quiet with ample power to lift any damper.

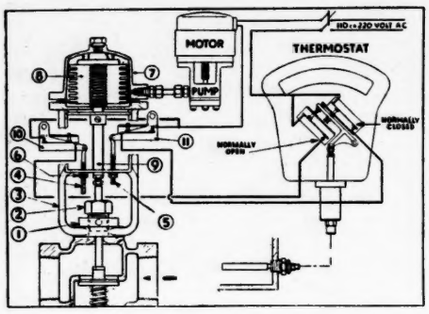
In addition to standard line, we furnish quotations on regulators for special applications. We also manufacture the Type B-22-A and B-22-W Limit Controls.

B-22 MOTOR

Well Built by Master Craftsmen

WHITE MANUFACTURING CO.

2364 University Ave. **St. Paul, Minn.**



Sarco Electric Temperature Control Systems

NAME—Sarco electric temperature control systems.

PURPOSE—To automatically control temperatures in a wide variety of applications.

FEATURES—System consists of either of two types of electric thermostats and hydraulic motor valve. The first type thermostats, models LSI and L2SI, have a flexible tube connection between the head and the sensitive control. The temperature is indicated on an accurate dial thermometer. Adjustment of the control temperature can be made while the instrument is in operation by turning a screw which moves a red indicator over the scale. The principle of operation is the expansion of a temperature sensitive liquid which compresses a bellows which in turn operates an electric switch and the temperature indicating pointer.

The second type thermostats, models LSC and L2SC, are similar to the first except that the indicating feature is omitted. All thermostats have ranges between —40F and 650F.

There are two types of hydraulic motor valves available which were designed expressly for use with the above thermostats. Type G is of the open-and-shut type. The thermostat starts and stops a motor-driven vane pump to build up oil pressure in the bellows chamber. This compresses bellows to which the valve push rod is attached. A limit switch interrupts the circuit momentarily at the end of the stroke, causing the valve to oscillate slightly in the wide open position. When the thermostat opens the electric circuit, the valve returns automatically to the closed position by spring pressure. Type GT is of the throttling type. It is used with double switch thermostats. An additional limit switch is provided at the half-way point in the valve stroke so that the valve can be held open at this point, between opening wide or closing all the way. The positions of both limit switches are adjustable by the user, who can readily regulate both the full open and the throttling positions of the valve, to secure accurate temperature control under given conditions of load. These instruments are based on patents and designs which Sarco has acquired from the Wilbin Instrument Corp.

AVAILABLE SIZES—Valves available in sizes from ½ to 4 in.

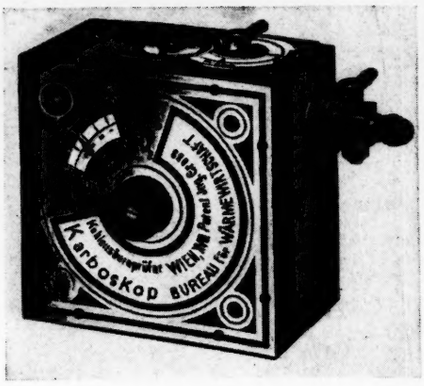
MADE BY—*Sarco Co., Inc., 183 Madison Ave., New York.*

Carboscope CO_2 Analyzer

NAME—Carboscope CO_2 analyzer.

PURPOSE—A small pocket-size apparatus for determining the percentage of carbon dioxide in gases.

FEATURES—The manufacturer states that this apparatus is entirely made of metal, does not contain any liquid, and may be operated by any untrained person. It is said that an analysis may be made within one half a minute which will be accurate to 1/3 of 1%. In making the analysis, a sample of the gases is pumped by a small rubber pump through the



apparatus; two valves are then closed and the apparatus is then inverted three times. The dial on the front of the instrument is then turned until a small lamp lights. The position of an arrow then indicates the percentage of carbon dioxide.

SIZE—The size of the instrument is approximately 3½ x 3½ x 2 in. and weighs about 2 lb. It is said that approximately 500 analyses can be made before the chemical has to be renewed.

MADE BY—Versuchsanstalt fuer Heiz-, Gas- und Kaeltetechnik, Vienna, Austria.

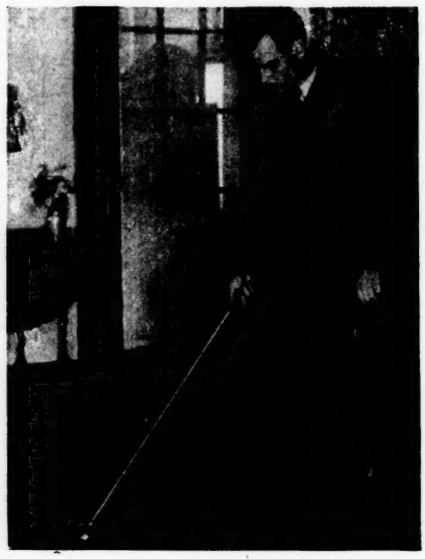
INFORMATION AVAILABLE FROM *Walter Kohn, c/o The Imco Co., 45 West 16th St., New York.*

Gil Radiation Computer

NAME—Gil radiation computer.

PURPOSE—For estimating house heating and air requirements of buildings.

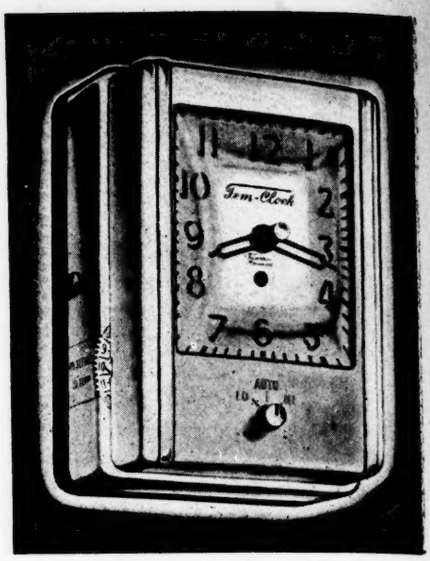
METHOD OF OPERATION—To compute the cubic contents of a room, the instrument is rolled along the length and width of the floor, and then up the wall, thus measuring



the three dimensions of the room. An indicator set in the hand then gives the cubic contents.

FEATURES—The instrument is 3 ft. long and can be folded and placed in a small leather case. It is said to offer a quick and accurate method of computing radiator surface requirements, areas, and cubical contents. It has also been found useful for determining the lineal feet of pipe required.

MADE BY—*Gas Industry Laboratories, Inc., 12-22—30th Ave., Astoria, Long Island, N.Y.*



Penn Temperature Clock

NAME AND MODEL NUMBERS — Tem-Clock, types 772 and 774.

PURPOSE — For automatic clock control of lowered night temperature. For use in connection with the Penn Temtrol.

FEATURES—Type 772 Tem-Clock is for service on all types of heating plants controlled by Temtrol (Penn heat anticipating room thermostat). It provides three control positions which the owner may easily set by means of a selector knob. These settings are (1) an automatic control whereby the clock operates a switching mechanism to automatically lower temperature at night and restore it in the morning; (2) continuous day level temperature; (3) continuous night level temperature. Time settings may be changed at any time. Type 774 for stoker installations performs the day-night functions of the standard 772 Tem-Clock and in addition operates a time interval, hold fire switching mechanism which can be set from 1 to 15 minute firing periods every 30, 60, or 90 minutes. This eliminates the need for a synchronous electric motor to operate a hold fire switching mechanism in the basement.

MADE BY—*Penn Electric Switch Co., Goshen, Indiana.*

Sampsel Synchronizing Control

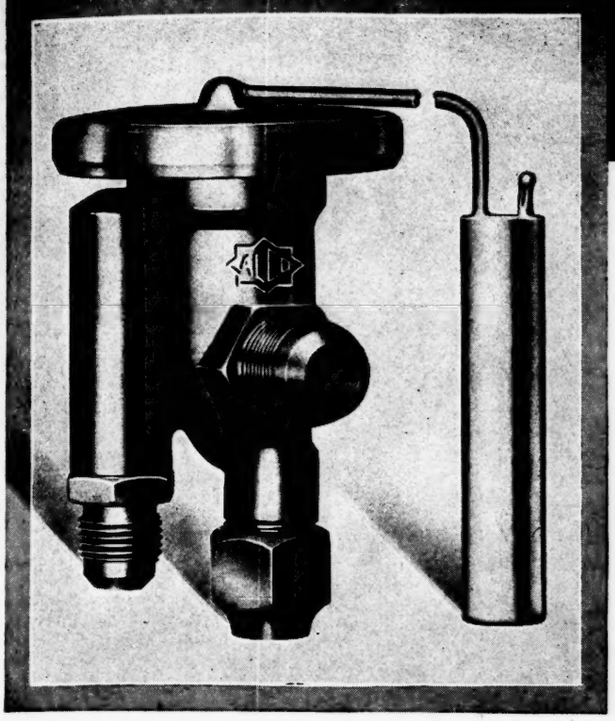
NAME—Sampsel synchronizing control.

PURPOSE—For controlling operation of warm air conditioning systems in both summer and winter. Also, for controlling stoker-fired, hot water plants which use a circulating pump.

FEATURES—On a warm air system a call for heat from the thermostat starts the stoker and also the blower. Both will continue to run until the thermostat is satisfied unless the temperature in the bonnet of the furnace builds up to the extent that the bonnet-switch cuts off. In this case the stoker will be stopped but the blower will continue to operate until the thermostat is served. Each control contains a standard fire pilot control for maintaining a continuous fire in mild weather. For summer operation the control may be used for cooling. The thermostat is set at the desired summer temperature and when the room temperature reaches this setting, the blower will start and continue to run until the room temperature falls below the setting. When this control is used with hot water plants, the circulating pump functions in the same manner as the blower on warm air systems.

MADE BY—*Sampsel Time Control Inc., Mendota, Ill.*

Now You Can Save 20% to 40% on ALCO *Small Capacity* Refrigerant Controls With the New "TK" THERMO VALVE



BUILT to traditional Alco standards of accuracy and trouble-free service, the "TK" incorporates all the proven advantages of the established Alco "T" Series Thermo Valves at a material saving in cost. Now Alco offers this high type control at a price within the reach of all small refrigeration and air conditioning systems.

The high type of control that is characteristic of every Alco Thermo Valve is essential if any system is to operate at the highest efficiency. Alco control keeps the line of complete evaporation within the narrowest of limits—utilizing the maximum amount of evaporator surface at all times. The Alco Model "TK" Thermo Valve makes such control available at a moderate price, suitable for small installations.

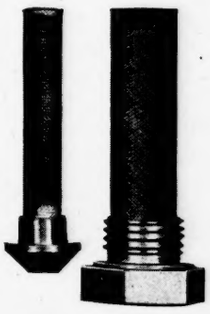
Write Alco or your Alco representative for complete information on the new "TK" Thermo Valve and for details of Alco's Engineered Refrigerant Control Service.

Check these distinctive ALCO features of the New "TK" Thermo Valve:

1 Atomic hydrogen welded power assembly that reduces failures to an absolute minimum.

2 No bakelite parts—the entire valve will stand full test pressure without injury.

3 Large and completely adequate filter area—over 1¾ square inches of filter surface.



Alco filter on right compared to usual size filter.

4 Light weight, simple design—yet as sturdy as all the larger Alco models.

5 Available in a variety of line sizes and capacities.

TYPE TK SPECIFICATIONS

*Type Valve	Refrigerant	Based on 1° Subcooling of Liquid at Valve Inlet. Maximum Tons of Refrigeration With Freon and Methyl Chloride and Under Pressure Differences Between Valve Inlet and Outlet as follows:							Stand. Lengths Capillary Tubing	Size Connections	
		30lb	40lb	50lb	60lb	70lb	80lb	90lb		In	Out
									Specify	Requirement	
TK0F	Freon	.25	.27	.29	**.30**	.31	.32	.32	2' or 5'	¼" or ⅜" SAE	½" or ⅜" x ½" SAE
TK1F	Freon	.95	1.05	1.10	**1.15**	1.20	1.25	1.25			
TK2F	Freon	2.00	2.20	2.40	**2.50**	2.60	2.70	2.80			
TK0M	Methyl Chloride	.50	.54	.58	**.60**	.62	.64	.64			
TK1M	Methyl Chloride	1.90	2.10	2.20	**2.30**	2.40	2.50	2.55			
TK2M	Methyl Chloride	4.00	4.40	4.80	**5.00**	5.20	5.40	5.60			

*Furnished with Internal Equalizer and External Remote Bulb Only—Outside Adjustment.

ALCO VALVE COMPANY, Inc.

2624 BIG BEND BLVD. ST. LOUIS, MISSOURI

ENGINEERED REFRIGERANT CONTROLS FOR HIGHEST EVAPORATOR EFFICIENCY

See this valve on the Glass Evaporator at Alco's Booth No. 248-9; International Heating and Ventilating Exposition.

Radiostat Temperature Control

NAME—Radiostat temperature control.

PURPOSE—For controlling the amount of heat to a building in accordance with outside conditions.

FEATURES—System consists of three temperature sensitive elements and a master electronic control. The temperature sensitive elements are sealed in a nickel steel case and consist of a non-corrosive electrical conductor wound on a special heat conducting base. The master control consists of two electronic tubes, resistors, and a motor starting relay.

METHOD OF OPERATION—The principle of operation of the system is that the resistance of an electrical conductor varies with a change of temperature. The regulating units of the system are coils of non-corrosive conductors encased and sealed against moisture. One of the units (C) is placed in the boiler water, another (F) on the return line, and a third (A) outside the building. When the outside air temperature decreases the resistance of the outside unit changes. This chance of resistance throws the circuits out of balance and an electronic tube in the master control (E) is called upon to restore this balance. In order to do that, more heat must be generated in the boiler, so the firing device is started. When the boiler sends steam through the system, eventually the return line is heated. The unit on the return line then restores the balance of the circuit.

On a winter morning the control is turned on at a predetermined time and the plant runs until the head of steam previously agreed upon is obtained. At this point, the plant will operate intermittently with a 1F boiler differential until the return starts heating, at which time the pressure will gradually drop as the demand for heat is diminished. The master control will automatically increase the temperature of the boiler water if either the outside temperature drops or the temperature of the return line decreases. If the return line temperature increases or the outside temperature increases the automatic control lowers the boiler water temperature so that less heat is sent to the building. When the outside temperature reaches 65F, no more steam is generated but the water is kept hot enough for supplying service hot water.

TYPES AVAILABLE—Applicable to steam, vacuum, or hot water heating systems.

MADE BY—*Radiostat, Inc., 1227 Washington Blvd., Chicago.*

M.S.A. Explosimeter

NAME—Explosimeter.

PURPOSE—For rapid determination of the presence of combustible gas hazards.

FEATURES—This instrument is designed to meet the demand of operating men for a portable instrument to show explosive gas concentrations. In size and weight the Explosimeter compares with a small folding camera.

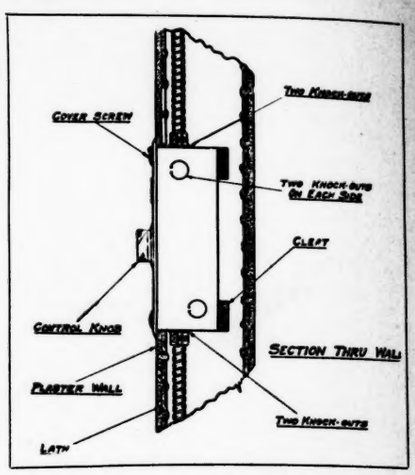
PRINCIPLE OF OPERATION—By operating a small piston-type pump a sample of the atmosphere to be tested is drawn through a length of hose into the instrument. Sampling line of practically any length may be used with no lag in the indicator reading except the time required to draw sample through the line. In the Explosimeter the gas sample flows over a hot platinum wire which forms a part of a balanced electrical circuit, current for which is provided by a small two-cell dry battery. This detector unit is balanced against the filament of a small electric light bulb burning in an inert atmosphere. Combustion of gases on the surface of the detector filament creates an increase in the temperature of the wire and consequently an increase in resistance, thus causing the electrical circuit to be unbalanced. This unbalancing of the circuit causes a deflection of the pointer of the electrical meter proportional to the concentration of gas in the atmosphere being tested. The concentration of gas may be read directly on the meter.

MADE BY—*Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa.*

Baldor Unit Heater Controller

NAME—Unit heater meter controller, flush type.

PURPOSE—A flush type controller in an attractive case for installation in offices, halls, lobbies, and other prominent spaces where the surface type would not harmonize with the surroundings. Control is designed for the same service as the surface type controllers. The box is designed to fit into a partition wall and is fastened as any other junction box. The control mechanism is assembled on a separate frame and can be removed while the box is being fitted in space. The cover fits flush over the box and to the wall similar to a wall switch or outlet. Cover is finished in



either black crackle or brushed brass. Available in two capacities, 1/3 and 1/6 hp.

MADE BY—*Baldor Electric Co., St. Louis, Mo.*

Johnson Modulating Attachment for Thermostatic Expansion Valves

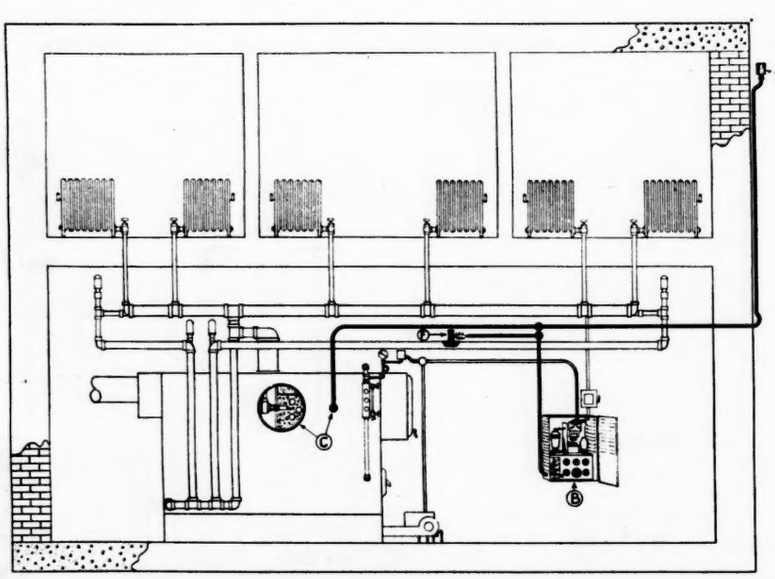
NAME—Johnson modulating attachment for thermostatic expansion valves.

PURPOSE—Attachments to various standard makes of thermostatic expansion valves for making a complete unit which is controlled by a distant thermostat as well as the usual bulb on the outlet of the evaporator.

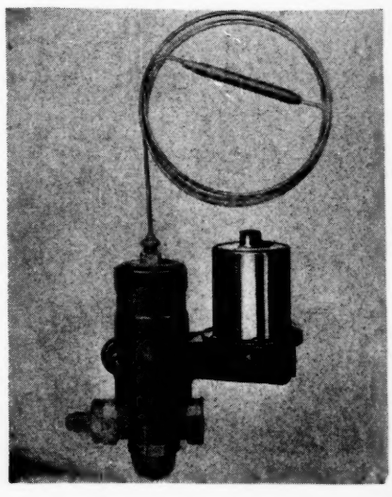
FEATURES—Valve is equipped with a Johnson compressed air motor to modulate the capacity of standard thermostatic expansion valves. The branch line of any standard Johnson instrument, such as a thermostat or a humidostat, is connected to the bellows which actuates the valve. The function of the attachment is to throttle the flow of refrigerant to the evaporator in response to the demand of the control instrument. When the control instrument calls for maximum capacity of the evaporator, the thermostatic member of the expansion valve operates in the conventional manner. The bulb of this member is fastened to the evaporator outlet and is adjusted to maintain the desired superheat. The pneumatic attachment for this device is said to actually meter the refrigerant to the coil according to the demand of the control instrument, giving true intermediate action.

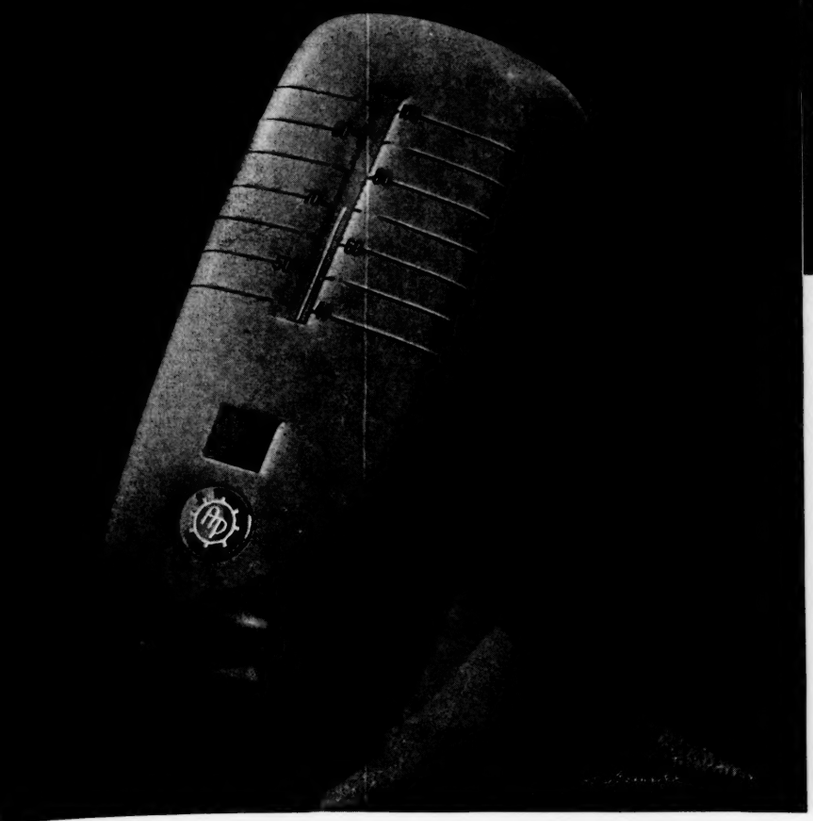
TYPES AVAILABLE—Available with a number of standard makes of thermostatic expansion valves.

MADE BY—*Johnson Service Co., Milwaukee, Wis.*



Radiostat temperature control operating one-pipe steam heating system.





The *Most Beautiful Thermostat* on the *Market* . . . plus *Accurate Control* . . .

Available in models for heating, with or without heat anticipator, and for cooling.

Installations . . Great or Small Are More Dependable with . .

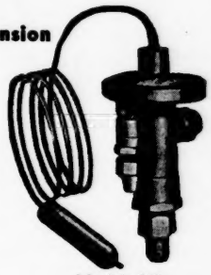
Air Conditioning Refrigeration Home Heating

A-P Controls

AIR CONDITIONING AND REFRIGERATION CONTROLS

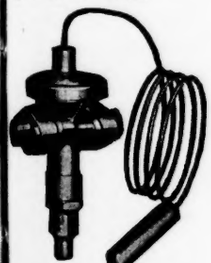
Thermostatic Expansion Valves

Easy to Service! Remove the bottom nut, and parts drop into your hand!

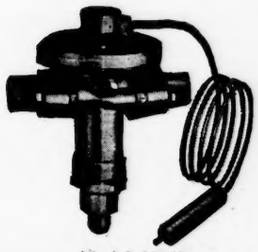


Model 205
Up to 2 Tons "Freon"

Model 210
1 to 4 Tons "Freon"



Model 215
3 to 6 Tons "Freon"



Model 220-K
8 to 15 Tons "Freon"

Refrigerant Solenoids

Model 70-NA
Model 70-N
15 to 40 Tons "Freon"

Model 73-RB
Also
Model 71-B
Water Valve

Model 78
Up to 8 Tons "Freon"

A-P "Controlling Influence" covers three great industries: Air Conditioning, Refrigeration, and Home Heating. Whether your installation is a Million Dollars or only a few Hundred Dollars, it still requires the same accuracy of CONTROL.

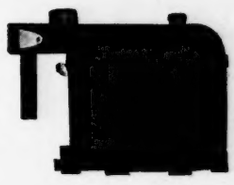
Efficient, Accurate, Dependable Control Equipment made under A-P Micrometric and Precision Standards pays the "dividends" in results that your customer expects,—whether it's in Air Conditioning, Refrigeration, or Home Heating.

AUTOMATIC PRODUCTS COMPANY

2462 North 32nd Street **Milwaukee, Wisconsin**

Constant Level Oil Control Valves for All Types of Gravity Fed Oil Burning Equipment

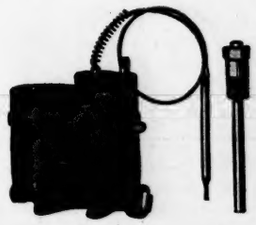
Model 240 Series Manual Control for Space Heaters



Model 240 Series Thermo Control for Space Heaters

Model 240 Series Electric Control for Furnaces, Space Heaters

Model 240 Series Thermo Electric Control for Forced Draft Water Heaters



Model 240 Series Thermo Water Heater Control

Model 241 Series Control for Mobile Units

Dependability a By-word for A-P Controls

NEWS OF THE MONTH

Propose Artificial Climate Center for New York; to Cost $6 Million

NEW YORK—A gigantic artificial climate center which would contain all the mineral and thermal waters of the world and would enable the people of this city to enjoy the advantages of exclusive summer resorts and spas was proposed at a meeting of the New York Physical Therapy Society on December 7.

The plan was described by Dr. I. Goldmerstein of Paris and Prof. Karl Stodieck of Berlin, both of whom have made extensive pioneer studies on the climate requirements of health.

The artificial climate center also would contain medical baths of all kinds—hot air, electrical, vapor, etc.—to meet every medical prescription. It also was proposed "to create an artificial beach of fine sand on the verge of a vast pool, warmed by an artificial sun and atmosphere, the whole establishment to be situated in the city itself, close to the main thoroughfare and open all the year around."

In this "climate paradise for the millions" the visitor would be able to bask in the sunshine of an "artificial Florida," or breathe the dry air of Arizona and New Mexico, or enjoy the benefits of the seashore or mountain tops, while drinking the waters of Carlsbad, Saratoga Springs, or other famous spas in various parts of the world. While the climate would be manufactured artificially, with the proper requirements of humidity, air pressure, ultra-violet radiation and temperature, the natural mineral waters of the world's spas would be available in bottles.

The entire cost of the project is put at $6 million.

New Reading Train Air Conditioned

PHILADELPHIA — Commuters between this city and New York carry fair weather with them on their daily trips aboard the Reading Railroad's new luxury streamliner which was put into service December 13. This train, composed of five air conditioned cars, makes two round trips daily between the two cities.

The air conditioning equipment used is a floor type cooling unit.

250 Attend Air Hygiene Meeting

PITTSBURGH—Approximately 250 industrial leaders, technical specialists, government officials, engineers, and physicians attended the fall meeting of the Air Hygiene Foundation held at Mellon Institute November 30. The subjects under discussion were the advances made in the control of occupational disease.

Heat Transfer Has Critical Point, Atkins Finds in Boiling Liquid Study

NEW YORK—Among the great variety of papers delivered at the annual meeting of the ASME held here December 6-10, those having to do with heat transfer and those on railroad air conditioning dealt especially with heating and air conditioning problems.

According to George A. Atkin of M. I. T. who, with W. H. McAdams, E. T. Sauer, and H. B. H. Cooper, conducted research studies, many of the commonly held ideas in connection with heat transfer are wrong. Mr. Atkin described and illustrated an experimental plant at the Institute to study heat transfer from a heat source across metals and into boiling liquids. This corresponds to heat transfer conditions frequently encountered in air conditioning work where heat is carried from air into a boiling liquid. Presenting their findings under the title "Heat Transfer to Boiling Liquids," Mr. Atkin presented photographs showing how the liquid is actually forced away from the metal, permitting a vapor film to form. It is believed that the presence or absence of this vapor film is what is responsible largely for changes in the rate of heat transfer.

Mr. Atkin showed that the heat transfer coefficient increases as the temperature difference increases but that with most liquids this increase finally reaches a maximum point after which it decreases very rapidly. Tests were conducted with a large number of organic liquids and also with water. The results showed how much greater the heat transfer rate is when water is used than when any other liquids are employed. He also showed that with a slightly roughened surface and any liquid the rate of heat transfer is much more rapid than with a polished metal surface.

At a session Thursday evening L. W. Wallace, recently appointed director of engineering and research for Crane Company, together with G. G. Early, Jr., presented a paper entitled "Air Conditioning of Railroad Passenger Cars." The paper dealt with test data accumulated during the course of extensive tests of railroad air conditioning conducted for the Association of American Railroads over the past several years.

Town Wants District Heating Plant

TILLSONBURG, ONT.—*The Tillsonburg News*, the town's weekly newspaper, is sponsoring a movement to establish a district heating system in the business section. It is claimed that such a system would be more economical than the numerous individual systems at present in use.

Enabling Legislation Urged by U. S. Housing Authority

WASHINGTON — Nathan Straus, administrator of the U. S. Housing Authority, appealed December 30 to 23 states for enabling legislation on which depends the success of the Federal Government housing program. Eighteen of these states have no laws under which local housing may be set up and present laws of the other five fall short of meeting provisions of the Wagner-Steagall Act.

States having at present no housing laws are: Arizona, California, Idaho, Iowa, Kansas, Maine, Minnesota, Mississippi, Missouri, Nevada, New Hampshire, New Mexico, Oklahoma, South Dakota, Utah, Virginia, Washington, and Wyoming.

Funds have been earmarked by the Housing Authority for projects in New York, Pittsburgh, Syracuse, Bridgeport, Jacksonville, Columbus, Detroit, East St. Louis, and Annapolis. Buffalo and Philadelphia will make application for the earmarking of funds shortly.

Phila. Dealers Study Fair Practices

PHILADELPHIA—The Oil Burner Division of the Electrical Association of Philadelphia held a luncheon meeting at its headquarters here in December to review its planned oil burner section in the Electrical and Radio Show which will be held here April 18. George R. Conover, managing director, and John Morrison, secretary of the electrical Association, announced that the requests for space in the exhibit would probably exceed the amount available.

G. Harvey Porter, managing director of OBI, attended the meeting and discussed the necessity of standardizing on formal local trade practices, and urged the Association to adopt a complete set of recommendations along this line. The chairman, F. C. Haab, appointed a special committee to make an immediate study and recommendation to the next meeting of the group, and it seems likely that Philadelphia will be one of the first key markets to adopt the Institute's regional plan on local trade practices.

New York YMCA Offers A.C. Course

NEW YORK — The New York YMCA Schools, 5 West 63rd Street, are presenting for the third successive year a course in Air Conditioning which aims to train laymen or professionals.

The approach to the subject is made from the physiological viewpoint. The subjects are developed as a series of events necessary to produce the optimum in comfort for the human being while in his native element.

Stacey, Bichowsky Discuss Drying

PHILADELPHIA — At the first symposium on drying and air conditioning sponsored by the American Chemical Society, and held at the University of Pennsylvania here December 27-28, papers by R. B. Derr of The Aluminum Company of America and by F. R. Bichowsky of Dow Chemical Company attracted much attention.

Mr. Derr addressing the symposium on the subject "The Drying of Air and Commercial Gases with Activated Alumina" described this process and some of the chemical properties of activated alumina. His paper also called attention to the ability of activated alumina to function at low air temperatures and to deliver either very dry air or air having any relative humidity desired. He explained that at present the principal application of activated alumina for air drying is in industry.

Doctor Bichowsky explained the cycle of air drying which makes use of lithium chloride. According to Doctor Bichowsky this process has found its best commercial application in industries where its special ability to produce either dry or moist air under accurate control makes it especially suitable.

Appearing on the program also was A. E. Stacey, Jr., well-known in the air conditioning industry both for his research activities and for his connection with contract installation work. Mr. Stacey's paper appeared under the title "Comparison of Rate of Evaporation of Moisture from a Wet Material and from a Free Water Surface."

The symposium was well attended in spite of occurring during the holiday period and the entire two days were taken up with both morning and afternoon sessions.

Portland Hotel Air Conditioned

PORTLAND, OREG.—An extensive modernization program, involving complete air conditioning of the famous Oak and Crystal dining rooms, with installation of all-electric ranges and kitchen equipment, has been completed at the Hotel Benson here. Among these changes, the Benson has replaced its old heating plant with Northwestern Electric's central heating service and hot water supply system.

A new, electrically-refrigerated water cooling system circulates cold water to all rooms. By automatic control, hot water to the rooms is maintained at an even temperature of 150F, day and night.

Air conditioning of the dining and banquet rooms marks a progressive step on the part of this hotel. Although air conditioning is making rapid strides throughout the country, this is one of the few hotel installations in the northwest.

Vertical Air Currents Remove CO_2 from Urban Centers

NEW YORK—The fact that a city breathes vertically, that it is the fresh air which descends from above and not the fresh air supplied horizontally by the wind which absorbs the carbon dioxide released by the town was reported by Prof. Karl Stodieck at a meeting of the New York Physical Therapy Society on December 7. Professor Stodieck's report was based on a study made recently in Berlin.

"Neither the parks nor the wind," Professor Stodieck reported, "are able to absorb the considerable quantities of CO_2 released by the town. It has been found that Berlin, with a central diameter of seven miles, takes in, in its streets, about 20,500,000 lb. of CO_2 per day from all kinds of exhausts, such as human, motors, heating, etc. To remove this amount would require a wind of 79 ft. per sec. horizontal velocity, and such winds are non-existent. Yet every analysis shows that the air is purified.

"The equivalent of the vertical movement of the air does the job with a velocity of 0.12 ft. per sec. This calculation proves decisively that, in view of the insignificance of the ascending speeds, a town breathes vertically."

These findings prove, Professor Stodieck said, that large parks and gardens of the big cities do not fulfill the function of purifying the air of the cities, that is, of the whole cities. They merely benefit a few streets and alleys in the immediate vicinity, or the crowds that take the trouble to visit them.

Coal Committee Reelects Cosgrove

CHICAGO—John C. Cosgrove, of Johnstown, Pa., was reelected chairman of the Committee of Ten, Coal & Heating Industries, at the annual meeting of the organization's general council held in Chicago November 30. Mr. Cosgrove, who has served as chairman of the Committee for three years, represents the National Coal Association on the Committee.

L. H. Dayhoff, Chicago was reelected vice-chairman and Harry H. Kurtz, Chicago, was reelected treasurer. J. Harvey Manny was elected secretary and Marc G. Bluth was reelected assistant treasurer and secretary.

HEATING & VENTILATING Index For 1937

The annual index for the 12 issues of HEATING & VENTILATING for 1937 is being prepared and will be mailed on request to any subscriber without cost. Address Circulation Department, HEATING & VENTILATING, 148 Lafayette St., New York.

Charleston Leads in Oil Burners

NEW YORK — Charleston, S. C., leads American cities in percentage of oil burner installations. No less than 74% of its total number of dwelling structures with central heating plants have oil burners, according to the Oil Burner Institute.

Hartford, Conn., runs a good second, with 69% of its centrally heated homes having oil burner installations; the West Coast follows New England in third place, San Francisco having 60%. Boston is fourth, with 47%. The full list of cities having over 20% oil burner installations are, in order: Lynn, Mass., 46%; New Haven and Bridgeport, 45%; Oakland, Calif., 43%; Fall River, 42%; Springfield, Mass., 40%; Portland, Maine, 38%; Worcester, Mass., 36%; Providence, R. I., 35%; Seattle, Wash., 32%; Washington, D. C. and Waterbury, 30%; New Bedford, 26%; Minneapolis, 25%; St. Paul, 23%; Metropolitan New York, 23%; and Omaha, 21%. In actual number of installations, of course, New York leads with close to a quarter million.

Columbia Continues A. C. Courses

NEW YORK—The School of Architecture of Columbia University, with the cooperation of the department of mechanical engineering, is offering two evening courses in air conditioning for the third consecutive year. The courses are of approximately fifteen weeks' duration, and are offered in both the winter and spring sessions.

Air Conditioning I is a basic or general course, designed to present fundamental principles of air conditioning and of air conditioning systems, as well as the relation and functioning of the various units of a system. This general course is given by Robert W. Waterfill.

Air Conditioning II is a technical course intended for advanced students in mechanical engineering, and those who have had sufficient technical experience in the laboratory, field, or office. The purpose of this course is to assist students entering any of the many phases of design that are connected with the use and improvement of air conditioning equipment.

These two courses will be offered in the evenings in the spring session, beginning early in February.

Carrier Adds Silica Gel Equipment

SYRACUSE, N. Y.—An announcement has been made by Carrier Corporation that by joint arrangement with The Bryant Heater Co., Cleveland, Carrier will add silica gel gas-operated dehydration equipment to its line of air conditioning apparatus. Bryant will continue to distribute gas-operated silica gel equipment through its own organization.

Canada Water Situation Discussed

TORONTO—Over eighty members and guests were present at the December meeting of the ASHVE Ontario Chapter and heard two interesting addresses on summer cooling problems. S. L. Elmer, Jr., of Carrier Engineering Corp., Syracuse, N. Y., spoke on "Methods for Comfort Cooling in Ontario Using Refrigeration," and P. Fitzsimmons very ably substituted for J. W. O'Neill, of Trane Co. of Canada, in discussing the subject "Methods for Comfort Cooling in Ontario Using Water Cooled Equipment."

Mr. Elmer stated that through mechanical refrigeration, it is possible to provide air at any desired temperature. In hotels, office buildings or apartments, the portable air cooling is possible only with mechanical refrigeration. The speaker said that if water is available in sufficient quantity, and at the proper temperature, a water cooling installation is the most economical.

Following the addresses the committee appointed to collect information about the availability of water for cooling purposes throughout Canada presented a tabulation of data received from water works departments. It was found that only two places in British Columbia had suitable water for cooling purposes. In Ontario, Guelph, Galt, Kitchener, and Toronto had reported suitable water, but reports from other provinces were unfavorable.

The January meeting of the chapter will be a joint one with the ASME and the Engineering Institute of Canada.

Cornell to Open Heat Transfer Lab

ITHACA, N. Y.—Cornell University is installing a new heat transfer laboratory in the Sibley School of Mechanical Engineering in order to further research and instructional work in air conditioning.

All seniors in mechanical engineering are required to take the course in heating and ventilating given by Prof. W. M. Sawdon, and this year 15 students have elected a new air conditioning option under Prof. C. O. Mackey.

Porter Addresses Baltimore Group

BALTIMORE—Carson Harrell, Pioneer Oil Heat Company, and T. E. Carson, Sherwood Brothers, arranged a luncheon meeting of the Baltimore oil burner dealers group at the Hotel Belvedere, Dec. 2, which was addressed by G. Harvey Porter, managing director of OBI. The Institute's plan for improvement of competitive market conditions was outlined by Mr. Porter and the group was urged to formulate a recommended code of practices for observance in the Baltimore area and a small committee appointed to submit preliminary recommendations along this line.

Indianapolis Dealers to Fight Oil Tax

INDIANAPOLIS — A regional dinner meeting of the Indianapolis Oil Heating Association, a division of the Electrical League of Indianapolis, was held at the Columbia Club here November 9. General conditions in the territory were reviewed, including the characteristics of the market which has low priced coal as its primary competition. The group is working on a local advertising campaign to be financed through oil company subscriptions and plans are being made for better presentation of the values of oil for heating as compared to gas. There is a state tax of 8 mills per gallon on fuel oil and it is proposed to organize for the repeal of this law at the next session of the legislature.

Among those present were W. C. Smith, Shell Petroleum Corp., president of the Association; Ted C. Brown, manager and secretary of the Electrical League of Indianapolis; G. Harvey Porter, managing director of OBI; James S. Milligan, Airtemp; Maurice D. Mulrey and Fred Jackson, of Gar Wood; Milton Rybolt and Charles H. Buck, Rybolt Heating; T. H. Endicott, General Electric; W. O'Reilly, of Reynolds; W. R. Williamson, Delco; H. A. Gruenholz, Wayne; Rudolph Stuempel, of Shell; C. C. Guthner, Crystal Flash, and Clayton Mogg, Standard Oil of Indiana.

Laboratory Approves 104 Devices

PRIMOS, PA.—One hundred and four pieces of anthracite burning equipment and heat control accessories produced by 71 manufacturers now bear the red and white seal of approval of the Anthracite Industries' testing laboratory here, according to Allen J. Johnson, director of the laboratory.

All of these approvals were granted prior to October 15, 1937, and include automatic anthracite stokers, semi-automatic central heating units, magazine feed boilers, domestic and commercial cooking ranges, hot water heaters, space heaters, winter air conditioning units and temperature regulating devices.

Welding Lectures Planned in N. Y.

NEW YORK—The New York section of the American Welding Society is sponsoring a series of lectures on the fundamentals of welding at the Brooklyn Polytechnic Institute. The course will be free to members of the Society and a fee of $5 will be charged to non-members.

The course comprises a series of about ten lectures beginning January 11. Further information can be obtained from the American Welding Society. 33 W. 39 St., New York.

Dealers Stirred by Gas Competition

MINNEAPOLIS — A regional luncheon meeting of the Twin City Oil Burner Association was held here November 11. Francis Hubbard, Hubbard Oil Burner Co., president of the Association, presided. C. H. Chalmers introduced G. Harvey Porter, managing director of OBI, who addressed the group on regional activities throughout the country.

A local advertising campaign is being conducted by the oil companies to combat the severity of local gas competition. Some disturbance has been felt on account of local union problems affecting the installation of equipment, and the oil burner group represents the best nucleus available for dealing with this problem.

Mr. Porter outlined the method of analyzing a local price situation through the building up of costs by groups including price of burner, installation, sales, advertising, and service costs.

City Law Requires Fan Shielding

BIRMINGHAM, ALA. — An ordinance making it unlawful to operate any ventilating or exhaust fan in any building other than a residence without the blades effectively shielded from danger from contact with human beings, was adopted by the Birmingham city commission recently.

A young woman employed by a downtown bakery is reported to have died recently as result of injuries from an unprotected exhaust fan.

Nelson T. Branche

CLEVELAND—Nelson T. Branche, chief engineer of development and design at The Bryant Heater Co., Cleveland, since 1935, died suddenly after a major operation November 26 at University Hospital here.

A graduate of Pratt Institute, he became connected with the Cities Service Company of New York in 1918. In 1925 he took up a position with Surface Combustion and remained with that company until he went to Bryant.

Mr. Branche was born in Norwich, Conn., May 7, 1898. He is survived by his wife, two sons, mother, father, and sister.

Norman M. Small

WAYNESBORO, PA. — N. M. (Scotty) Small, for 34 years a member of the engineering department of Frick Co., died November 28. He had been in ill health for the last two or three years.

Mr. Small served in various capacities at Frick and in 1922 was made chief engineer of the refrigerating machinery department. In 1935 he became consulting engineer for the company.

He is survived by his wife, mother, and a sister.

AT GRAND CENTRAL PALACE NEW YORK JANUARY 24 TO 28, 1938

GRAND Central Palace, where three full floors are required to accommodate the display, is between 46th and 47th Streets on Lexington Avenue. It is but a step from Grand Central Station; close to the Roosevelt at 45th Street and Madison Avenue, headquarters of ASRE and the National Warm Air Association meetings; within walking distance of the Biltmore, 43rd Street and Madison Avenue, where the ASHVE meeting will headquarter. About 300 exhibits promise the fullest display ever assembled of the products of every branch of this industry. With these meetings and the exposition all taking place in one week, you should plan to attend.

For convenient reference and to assist in finding the exhibits without loss of time, floor plans and booth locations at the Show are shown on the next three succeeding pages, while detailed programs of the several meetings are given on pages 164 and 165.

Winter Equipment at the Exposition

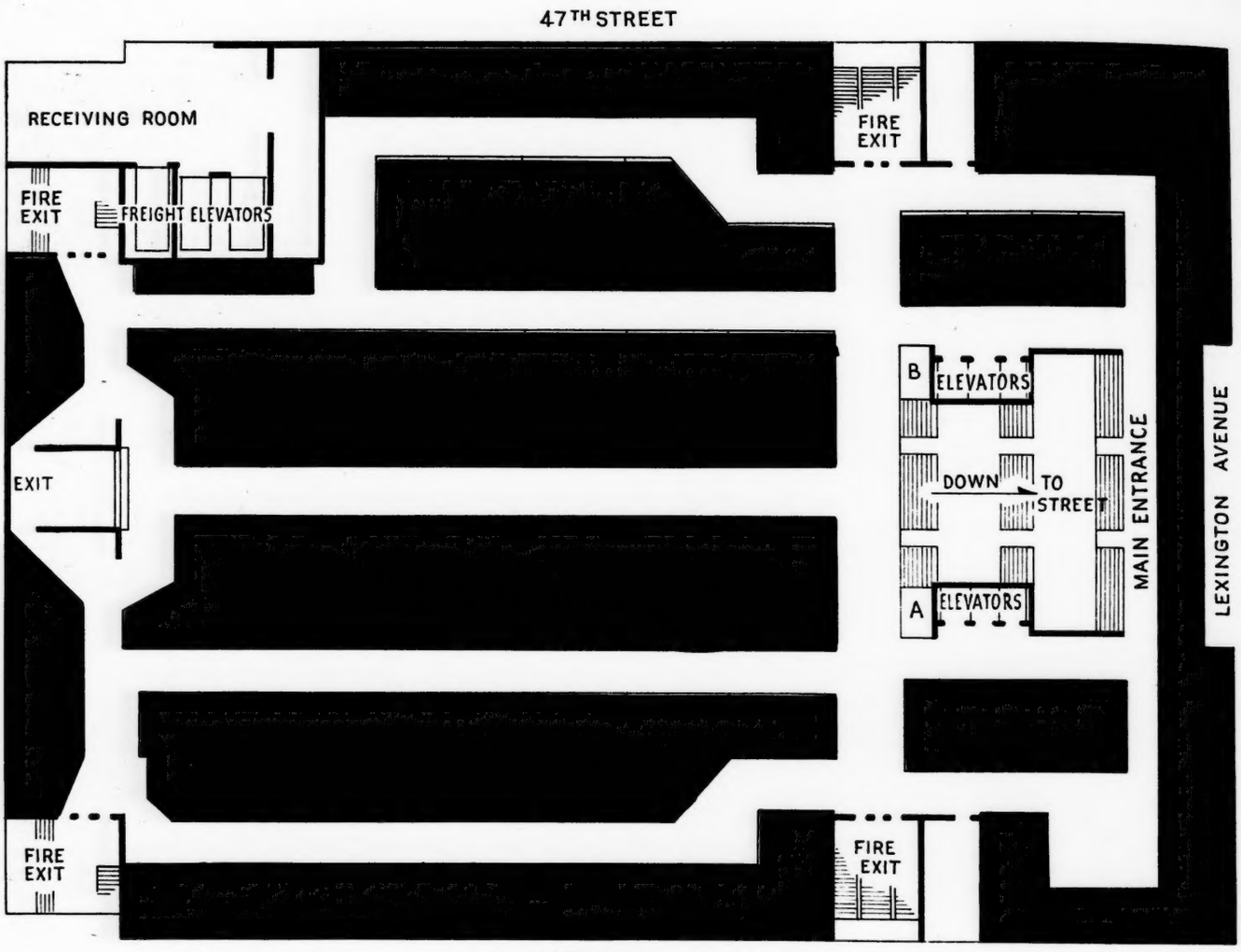
Included in the Exhibit will be a varied display of domestic heating equipment emphasizing beauty of design, ease of operation, year-round service, and showing economies in original investment and operating costs which will appeal to the residential consumer. One exhibitor will show a coordinated boiler and wall-flame burner that is rated at a maximum of 1 gal. of oil per hour, and is equipped with automatic controls and an indirect heater for year-round service. Another display will feature a noiseless Scotch marine oil burning boiler that has won many awards for its attractive jacket. This steel boiler guarantees instantaneous domestic hot water at any city pressure.

Emphasizing an even flow of clean, warm air at all times, one maker of gas- and coal-fired winter air conditioning units will show a gas equipment which has direct connected blowers with eight-speed control. This unit is noted for its attractive design, compactness, and

(Continued on page 163)

Fifth International Heating and Ventilating Exposition

MAIN FLOOR



A

550-551—Adams Engineering Co.
288-289—Advance Engineering Co.
230—Aerofin Corporation
11—Air Conditioning Blue Book
83-84—Air Conditioning Combined with Oil Heat
454—Air Conditioning Distributors Co.
316-317—Air Controls Inc., Div. of Cleveland Heater Co.
535—Air Devices Corp., Thermal Units Mfg. Co. Div.
528—Air-Maze Corporation
70—Airtemp, Incorporated
344-345—Airtherm Manufacturing Co.
248-249—Alco Valve Company, Inc.
463-464—Aldrich Company
203 to 205—Allis-Chalmers Manufacturing Co.
528—Alpha Steam Specialty Co.
451 to 453—American Air Filter Co.
42—American Artisan
3—American Blower Corporation
65—American Brass Company, The
5—American Gas Products Corp.
215—American Machine & Metals, Inc., DeBothezat Ventilating Equipment Div.
65—American Metal Hose Branch, The American Brass Co.
214—American Oil Burners & Heating Utilities
2 to 6—American Radiator Company
69—American Rolling Mill Company
A (Main Floor)—American Society of Heating & Ventilating Engineers and American Society of Refrigerating Engineers
52-53—American Steel & Wire Co.
508 to 510—Anchor Post Fence Co., Fluid Heat Div.
235—Anderson Products, Incorporated
295 and 2N—Anemostat Corp. of America
237 to 245, 283 to 287, 300 to 305—Anthracite Industries, Inc.
454—Apex Electrical Mfg. Co.
288-289—Armstrong Machine Works
288-289—Armstrong Steam Trap Co.
505—Auer Register Company, The
543-544—Auto-Heat Corporation
21—Automatic Burner Corp.
11—Automatic Heat & Air Conditioning
261-262—Automatic Products Co.
560—Automatic Temperature Control Inc.
34—Autovent Fan & Blower Co.

B

533-534—Babcock & Wilcox Co., The
45—Baker Ice Machine Co.
224—Baldor Electric Company
442—Baldwin-Hill Company
525—Balloffet Dies and Nozzle Co. Inc.
323 to 325—Barber-Colman Company
312-313—Barnes & Jones, Inc.
422—Beaton & Cadwell Mfg. Co., The
28E—Beaver Pipe Tools Incorporated
28W—Bell & Gossett Company
71—Bethlehem Steel Company
490 to 492—Binks Manufacturing Co.
462—Black & Decker Mfg. Co.
415—Boiler Room Equipment, Inc.
282—Breuer Electric Mfg. Co.
19-20—Brown Instrument Company
66-67—Bryant Heater Company, The
26-27—Buffalo Forge Company
233-234—Burnham Boiler Corp. (also see Anthracite Industries, Inc.)

C

413-414—Carbondale Div., Worthington Pump & Mchy. Corp.
411-412—Carey Company, The Philip
52-53—Carnegie-Illinois Steel Corp.
227 to 229—Carrier Corporation
202—Carter Coal Co. Inc.
332-333—Cashin Co., W. D.
514—Celotex Corporation, The
314-315—Century Electric Company
268 to 270—Century Engineering Corp.
222—Chace Company, W. M.
78—Chicago Pump Company
540—Cole-Sullivan Engineering Company
52-53—Columbia Steel Co.
444—Condensation Engineering Corp.
536—Consumers Petroleum Corp.
Cook Electric Co. (see Anthracite Industries, Inc.)
337—Cork Import Company
54-55—Crane Co.
273—Crowe Name Plate & Mfg. Co.
Cruickshank Co. (see Anthracite Industries, Inc.)
495—Curtis Refrigerating Machine Co.
52-53—Cyclone Fence Co.

D

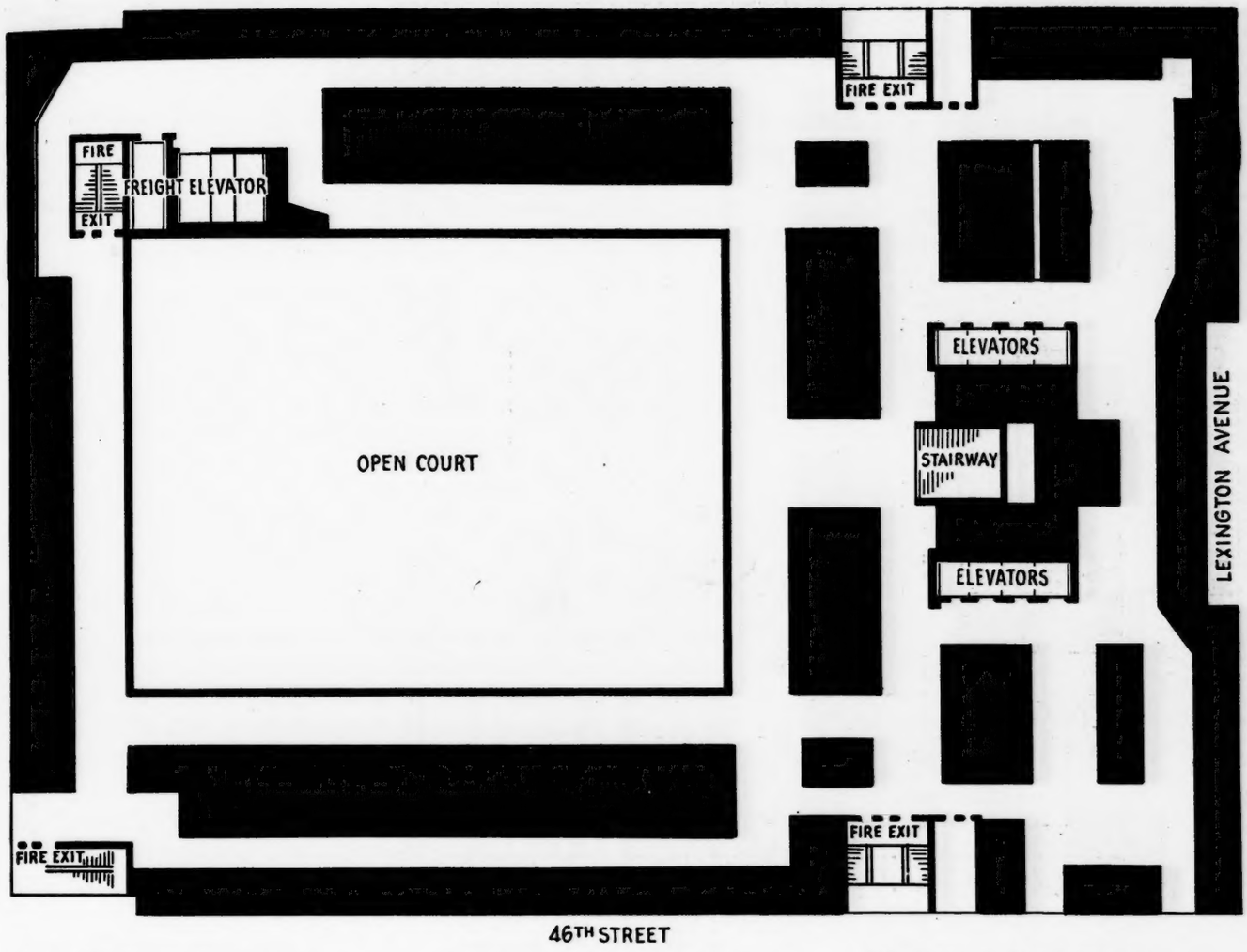
515—Davidson Fan Company
539—Davies Air Filter Co.
474—Dayton Rogers Mfg. Co.
334-335—Dayton Rubber Manufacturing Co.
215—DeBothezat Ventilating Equipment Div., American Machine & Metals Inc.
Deegan Regulator Co. (see Anthracite Industries, Inc.)
72-73—Delco-Frigidaire Conditioning Corp.
2—Detroit Lubricator Co.
206—Dole Valve Company, The
11—Domestic Engineering
402-403—Dooley, Walter F.
436—Dreis & Krump Mfg. Company
477—Dresser Mfg. Co., S. R.
46-47—Dunham Company, C. A.
561-562—Duo-Therm Div., Motor Wheel Corp.
497—Dupont Fuel Oil Burner Co., Inc.

E

485-486—Eagle Picher Sales Co.
58-59—Economy Pumping Machinery Co.
441—Electric Air Heater Co.
Electric Furnace Man, Inc. (see Anthracite Industries, Inc.)

Fifth International Heating and Ventilating Exposition

MEZZANINE



554 to 557—Electrol, Incorporated
402—Electronic Control Corp.
340-341—Emerson Electric Mfg. Co., The
565-566—Evans Corporation, The George

F

89-90—Fairbanks, Morse & Company
432—Fairfield Oil Heating Co., Inc.
346-347—Fedders Mfg. Co. Inc.
415—Field Manufacturing Co.
64—Fitzgibbons Boiler Company, Inc.
508 to 510—Fluid Heat Div., Anchor Post Fence Co.
5—Fox Furnace Company, The (also see Anthracite Industries, Inc.)
74—Frick Company
49—Friez & Sons Inc., Julien P.
252-253—Fulton Sylphon Company
408—Furblo Company

G

246-247—Gar Wood Industries Inc.
507—General Controls Co.
7—General Electric Company, Air Conditioning Dept.
24—General Electric Company
409-410—General Fittings Company
455—General Oil Heating Corp.
221—General Refrigeration Corp.
530—Genesee Electric Products Co.
545 to 549—Gilbert & Barker Mfg. Co.
259—Gilbert & Son Inc., Harry E.
332-333—Grinnell Company, Inc.
470—Grob Brothers

H

489—Harris & Company, Arthur
496—Harsch Co., Inc., H.
22—Hart & Cooley Manufacturing Co.
42—Heating, Piping & Air Conditioning
277—HEATING & VENTILATING
23—Heil Co., The
210A to 210C—Henry Furnace & Foundry Co., The
431—Henry Valve Company, Inc. Hershey Machine & Foundry Co., Inc. (see Anthracite Industries, Inc.)
515—Hinrichsen, Inc., A. F.
58-59—Hoffman Specialty Co.
216—Hotstream Heater Co., The

I

68—Ilg Electric Ventilating Co.
81-82—Illinois Engineering Company
38—Illinois Testing Laboratories Inc.
264—Imperial Brass Mfg. Co., The
487-488—Independent Air Filter Co.
319-320—Independent Register Co., The
277—Industrial Press, The
512-513—Ingersoll-Rand Co.
529—Insto-Gas Corporation

J

James Regulator Co. (see Anthracite Industries, Inc.)
475—Janette Mfg. Co.
13—Jenkins Bros.
87-88—Johns-Manville
256 to 258—Johnson Co., S. T.
75—Johnson Service Company
499 to 501—Joliet Heating Corporation
48—Jones & Laughlin Steel Corp.

K

469—Kaustine Co., Inc.
326 to 331—Kelvinator Div., Nash-Kelvinator Corp.
467—Kent Company Inc.
4—Kewanee Boiler Corp.
21—Kleen-Heet Incorporated
Kol-ax Co., Inc. (see Anthracite Industries, Inc.)
526-527—Korth Oil Burner Corp.
211—Koven & Bro., L. O.

L

260—Lamneck Products Inc.
265-266—Lau Blower Co., The
502 to 504—Lochinvar Corporation
318—Lycoming Mfg. Co., Spencer Heater Div.
433—Lynn Products Co., Inc.

M

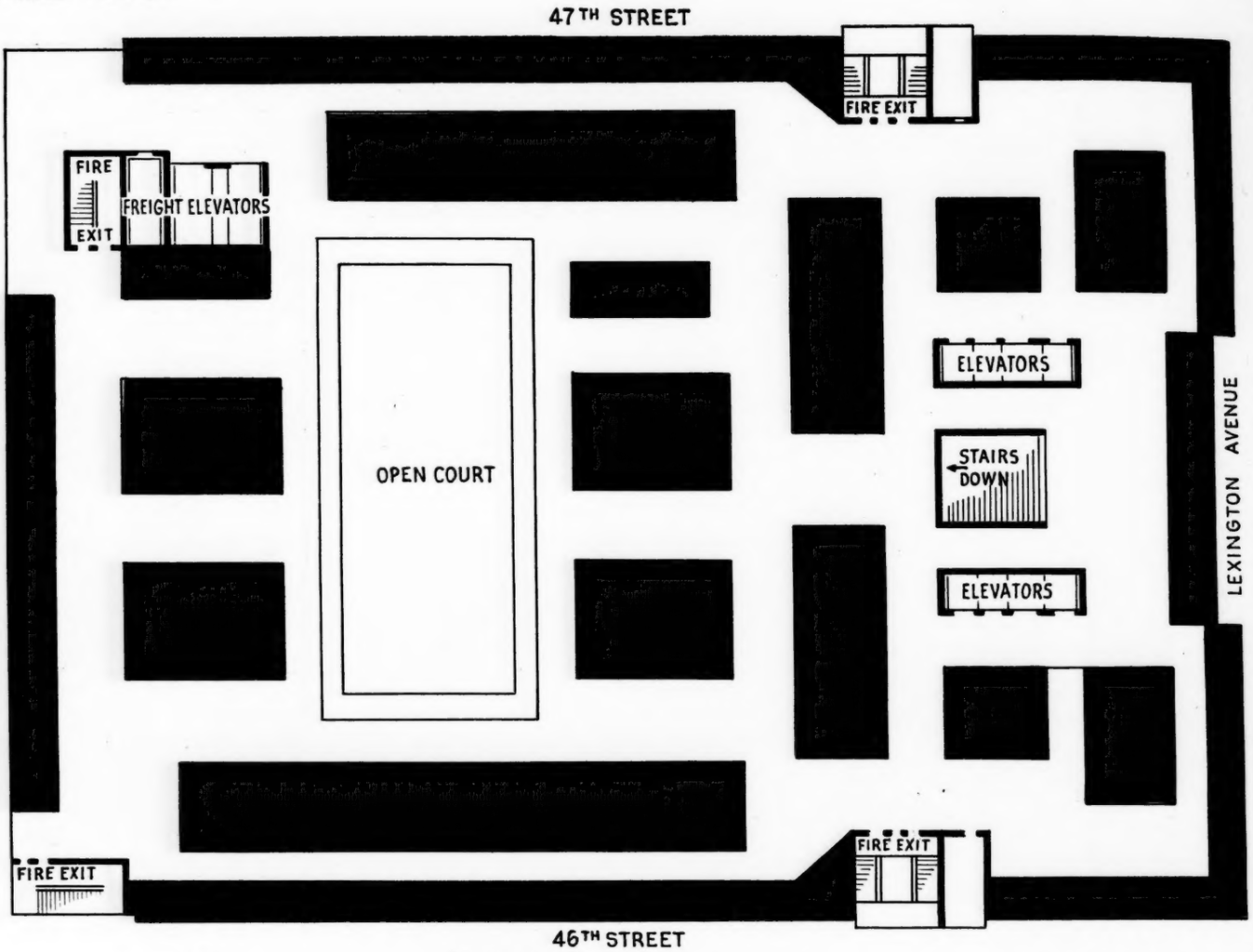
434—Maas & Waldstein Co.
471—Macrae Incorporated
35—Malleable Iron Fittings Co.
94—Marsh Corp., Jas. P.
406—Maurey Manufacturing Corp.
8—May Oil Burner Corporation
41—McDonnell & Miller
85-86—Mercoid Corporation, The
10—Meyer Furnace Company, The
502 to 504—Michigan Tank and Furnace Corp.
423 to 428—Micro-Westco, Inc.
403—Milwaukee Valve Co.
19-20—Minneapolis-Honeywell Regulator Co.
93—Modine Manufacturing Co. (also see Anthracite Industries, Inc.)
498—Mojonnier Bros. Co.
201—Monarch Manufacturing Works, Inc.
515—Montgomery Brothers
447—Motor Equipment Co.
561-562—Motor Wheel Corp., Duo-Therm Div.
14—Mueller Brass Co.
32-33—Mueller Furnace Co., L. J.

N

16—Nash Engineering Co., The
76-77—National Radiator Corporation
19-20—National Regulator Co., Div. Minneapolis-Honeywell Regulator Co.
298—National Sheet Metal Contractor
52-53—National Tube Company
15B—Nesbitt Inc., John J.
New York French Range Co. (see Anthracite Industries, Inc.)

Fifth International Heating and Ventilating Exposition

THIRD FLOOR



O

292-293—Oilheating & Air Conditioning Fuel Oil Journal
441—Oliver & McClellan Inc.
481-482—Owens-Illinois Glass Co.

P

2E—Patterson-Kelley Co. Inc., The
310-311—Penn Electric Switch Company
15C—Perfection Stove Company
12—Perfex Controls Company
39—Perfex Radiator Company
15A—Petroleum Heat & Power Company
290-415-416—Petrometer Corporation
40—Plibrico Jointless Firebrick Co.
11—Plumbing & Heating News
263—Plumbing & Heating Trade Journal
254-255—Preferred Utilities Manufacturing Corp.
441—Propellair, Inc.

R

342—Randall Graphite Products Corp.
559—Refractory & Insulation Corp.
445-446—Refrigeration & Air Conditioning Institute
494—Refrigeration Appliances, Inc.
407—Rega Manufacturing Co.
417-418—Reif-Rexoil, Inc.
60-61—Republic Steel Corporation
516—Reynolds Corp.
79—Richardson & Boynton Co.
528—Richmond Engineering Co.
250-251—Ric-wiL Company, The
483-484—Ridge Tool Company, The
336—Ruberoid Company, The
511—Russell & Co., W. A.

S

506—Sangamo Electric Co.
80—Sarco Company Inc.
528—Schade Valve Mfg. Co.
Schwitzer-Cummins Co. (See Anthracite Industries, Inc.)
531-532—Scott-Newcomb, Incorporated
52-53—Scully Steel Products Co.
259—Seaboard Refractories Co.
299—Sheet Metal Worker
231-232—Silent Glow Oil Burner Corp., The
419-420—Simplex Oil Heating Corp.
318—Spencer Heater Div., Lycoming Mfg. Co. (also see Anthracite Industries, Inc.)
37—Spencer Thermostat Company
448—Spoehrer-Lange Company
563—Standard Lime & Stone Co., The
465—Standard Products Co., The
449-450—Staynew Filter Corp.
208-209—Steel and Tubes, Inc.
212-213—Sterling Engineering Co.
291—Stoker & Airconditioner Journal
14—Streamline Pipe and Fittings Div., Mueller Brass Co.
9—Sturtevant Company, B. F.
223—Sundstrand Engineering Co.
343—Sundstrand Machine Tool Co.
223—Sundstrand Sales Co.
530—Supreme Electric Products Corp.
278 to 281—Surface Combustion Corp.
404—Swirling Heat, Inc.
252-253—Sylphon Control Systems Inc.

T

44A—Taco Heaters, Inc. (also see Anthracite Industries, Inc.)
52-53—Tennessee Coal, Iron & R.R. Co.
535—Thermal Units Mfg. Co. Div., Air Devices Corp.
210—Thrush & Company, H. A.
56-57—Timken Silent Automatic Div., Timken-Detroit Axle Co.
552-553—Titusville Iron Works Co., The
493—Toledo Pipe Threading Machine Co.
267—Tork Clock Company, The
207—Torrington Mfg. Company, The
567—Tuthill Pump Company
271-272—Tuttle & Bailey, Inc.

U

306 to 309—United States Radiator Corp.
25—United States Register Co.
52-53—United States Steel Corp.
437 to 440—Utica Radiator Corp.

V

568—Viking Air Conditioning Corp.
457—Viking Pump Co.
31—Vilter Manufacturing Co., The
564—Volcano Burner Corp.
461—Vortex Manufacturing Co.
429-430—Voss Co., J. H. H.

W

517-518—Wagner Electric Corp.
435—Ward Machinery Co.
211—Waterfilm Boilers Inc.
421—Waterloo Register Company, The
338-339—Waterman-Waterbury Company
236—Watts Regulator Co.
18—Webster Electric Company
43 and 44B—Webster & Company, Warren (also see Anthracite Industries, Inc.)
321-322—Weil-McLain Company
91-92—Westinghouse Electric & Mfg. Co.
209A—White Manufacturing Co., The
296-297—Whiting Corporation
479-480—Whitney Metal Tool Co.
225-226—Williams Oil-O-Matic Heating Corp.
A (Mezzanine Floor)—Wilson Co., The H. A.
30—Wing Mfg. Co., L. J.
413-414—Worthington Pump & Mchy. Corp., (Carbondale Div.)

X

558—"X" Laboratories Inc.

Y

541-542—Yarnall-Waring Company
50-51—York Ice Machinery Corporation
62-63—York Oil Burner Co., Inc.
275-276—Young Radiator Company
569—Young Regulator Company
17—Youngstown Sheet & Tube Co., The

ease of installation. At another exhibit, home heating units using low price fuel oil will be demonstrated in actual operation with fires automatically controlled. In addition, these units supply clean, hot water continuously at low cost, using the same burner and furnace that air conditions the home.

A turbine type horizontal rotary cup burner will be of interest to the domestic, commercial, and industrial fields. This burner is described as maintaining high efficiencies as a result of synchronizing the oil and air, both primary and secondary, throughout the operating range of the oil burner. Whether the burners are manual, semi-automatic, or full automatic, adequate control is assured. This holds true for use with any grade of oil, including those which require preheating.

Solving the problem of frozen tubes, which has troubled engineers for years, one exhibitor will show a heating surface with steam distributing tubes that maintain absolutely uniform air discharge temperatures, by means of modulating steam valve control, over the entire face area of the heating surface. Thus the possibility of frozen tubes is prevented without the use of pre-heaters.

With a variety of 18 different sizes in residence boilers, including square and round types for coal, oil or gas stoker, another exhibitor will make a bid to solve every home heating problem. In the same field, a forced air heater which claims to meet the problem of small space heating jobs will be on display. This same manufacturer will feature a gas-fired winter air conditioning unit with a push button lighter and throttling gas actuated controls that are rated at 80% efficiency. In another display, an automatic magazine feed heater, described as having no moving or mechanical parts to get out of order or require repair, guarantees a steady, uniform heat.

Internal and built-in water heaters of both the storage and tankless types will be shown by many exhibitors. Although the built-in heaters are furnished as standard equipment with practically all leading cast-iron boilers and many steel boilers, the tankless heaters are becoming increasingly popular. In this connection, one exhibitor will feature storage type hot water generators constructed of strengthened copper.

Summer Equipment

The ever-growing demand for inside comfort during the summer months has led to many refinements in summer air conditioning design and equipment since the last Exposition. One exhibitor of summer air conditioning systems will feature air diffusion equipment which simultaneously supplies and extracts air and mixes room air with incoming air within the apparatus. A motion picture showing smoke tests will demonstrate the actual functioning of this product. Another display in the same exhibit will show a glass case containing equipment through which confetti periodically is blown. This will illustrate the even distribution of the confetti over the bottom of the glass case. The confetti is then sucked back into the container, again proving even distribution. In addition there will be a demonstration of high velocity air diffusion devices which are stated to guarantee the even distribution of any volume of air at any velocity without draft, together with an air-mixing effect whereby 35% of the room air is drawn into the device and mixed with the incoming air. Another mechanism is especially designed to prevent drafts in air conditioned rooms or rooms equipped with forced ventilation.

For air conditioning in one room, unitary air conditioners, obtainable in a package, will be shown. The same exhibitor will demonstrate central station heating equipment which provides for cooling in one or a great number of individual rooms from a centrally located compressor.

For consumers of refrigeration devices, a group of spray systems will be on hand, including cooling towers and spray nozzles for air conditioning and air washing. Spray towers and various size nozzles will be seen in actual operation.

In connection with refrigeration, there will also be an exhibit of compressors which are described as being of a vertical type with an exceptionally low horsepower consumption per ton of refrigeration.

Year-Round Equipment

The trend toward air conditioning for 12 months out of the year has resulted, in some cases, in a merging of the two components of air conditioning into a single unit or system. Thus the Exposition will include many summer and winter, or year-round systems for residential, commercial, and industrial adaptation. Provision is made for the consumer's control over temperature, humidity, heating, cooling, and ventilation with a maximum of economy and a minimum of bother due to almost universal application of automatic devices.

One exhibitor will feature in his display not only year-round domestic air conditioning, but also will include electric refrigerators, ranges, washers, and ironers. In the same exhibit, home "packages" for year-round air conditioning and electrical conveniences will be found, as well as systems for commercial air conditioning.

A furnace manufacturer will exhibit a summer cooling system that can be connected to the winter heating equipment, as well as a complete year-round air conditioning system. On display will be a complete installation of a modern air conditioning system with the latest devices for providing for and controlling indoor climate, including air ducts, humidifiers, filters, blower-fans, and automatic temperature and humidity controls. One feature in this display will be a "zone control" whereby each zone can be maintained at any desired conditions according to its individual requirements.

Recommended as year-round air conditioning equipment for small shops, stores, and offices will be a unit heater whose inlets and outlets are on the back so that all unsightly pipe traps and connections are hidden. A different type of heater in the same exhibit gives out two streams of air from a single fan. Its use is especially suited for large spaces such as auditoriums.

One unit heater to be seen on display combines both heating and cooling without any structural change. Another heater can be operated at pressures from atmospheric to 250 lb. steam. A part of the same exhibit will be an automatic humidifier for domestic application.

An indirect heater with a draft control which is said

(Concluded on page 166)

PROGRAM

American Society of Refrigerating Engineers 33rd Annual Meeting January 25-27, 1938 Hotel Roosevelt, New York

January 25—Tuesday

a.m. 10:00—Refrigeration in Modern Breweries, G. B. Bright

The Field of the Food Technologist, Prof. B. E. Proctor

How Cities are Fed, Walter P. Hedden

p.m. 2:00—Flow of Refrigerant Fluids, A. B. Stickney

Viscosity of Oils Diluted with Refrigerants, O. C. Rutledge

Industrial Relations, L. A. Ruthenberg

9:30—International Casino Party, jointly with ASHVE and NWAH & ACA

January 26—Wednesday

a.m. 10:30—Heat Transfer in Low Temperature Ammonia Cooled Shell and Tube Brine Coolers as Affected by Operating Conditions, J. C. Consley

New Insulation Studies, F. G. Hechler and E. R. Queer

Economic Aspects of Refrigeration, D. L. Fiske

Thermodynamics of the Absorption Refrigerating Machine, B. H. Jennings and F. P. Shannon

p.m. 2:00—Joint Session with ASHVE (see ASHVE Program)

7:30—Annual Dinner-Dance

January 27—Thursday

a.m. 10:30—Refrigeration Storage Applied to Air Conditioning, W. F. Friend

Reports of Joint Committee on Air Conditioning Standards

Effect of Super Heat on Condensing Unit Efficiency, L. W. Child

Extended Surface Cooling Units—Design Calculations, R. H. Swart

Trade Schools in Refrigeration, Dr. J. S. Noffsinger

p.m. 2:30—Inspection of Lincoln Vehicular Tunnel

PROGRAM

National Warm Air Heating and Air Conditioning Association Annual Meeting—January 24-26, 1938 Hotel Roosevelt, New York

January 24—Monday

Meetings of the Association's Standing Committees and Board of Directors

January 25—Tuesday

a.m. 9:30—President W. L. Rybolt, Special Message

10:00—Arthur C. Willard, Address

10:30—What's Ahead in Residence Building, Thomas S. Holden

Welcome by Mayor F. H. La Guardia

The Legislative Straight Jacket on Business, Hon. Emanuel D. Celler

The Value of Cooperation Between the Architect and Our Industry, C. A. Kissinger

p.m. 2:00—Joint Session with American Society of Heating and Ventilating Engineers (see ASHVE Program) at the Biltmore Hotel

10:00—International Casino Party, jointly with American Society of Heating & Ventilating Engineers and American Society of Refrigerating Engineers

January 26—Wednesday

a.m. 9:30—Research Session. Chairman, C. A. Olsen

Report of the Research Advisory Committee. Chairman, F. G. Sedgwick

Investigation in Summer Cooling and the Trend of Furnace Sizes

Heat Losses and Temperature Drops in Forced Air Heating Ducts, Prof. S. Konzo and R. B. Engdahl

p.m. 1:30—Installation Codes Committee Report. Chairman, Prof. J. D. Hoffman

2:30—Recent Developments in the Filtration of Air, H. E. Birkholz

3:00—Meeting Outside Competition or Comparative Values, Frank E. Mehrings

3:30—Election of Officers

PROGRAM

American Society of Heating & Ventilating Engineers

44th Annual Meeting – January 24-28, 1938

Hotel Biltmore, New York

V

V

A. C. Buensod, New York Chapter, General Chairman of Committee on Arrangements

January 24—Monday

a.m. 9:30—Registration
10:00—Conference of Chapter Delegates

p.m. 2:00—Nominating Committee
2:00—Opening of Heating and Ventilating Exposition
6:30—Get-Acquainted Dinner; President's Reception

January 25—Tuesday

a.m. 9:30—Greetings, W. E. Heibel, President, New York Chapter
Response, President D. S. Boyden
Reports of Committees
Application and Economy of Steam Jet Refrigeration to Air Conditioning, A. R. Mumford and A. A. Markson
Cooling Tower Equipment and Its Relation to Water Conservation, S. I. Rottmayer

p.m. 2:00—Joint Session with National Warm Air Heating and Air Conditioning Association
Fundamentals Developed from Twenty Years of Research by the National Warm Air Heating and Air Conditioning Association, F. G. Sedgwick and Prof. A. P. Kratz
Air Distribution from Side Wall Outlets, D. W. Nelson and D. J. Stewart
Condensation Within Walls, F. B. Rowley, A. B. Algren, and C. E. Lund
10:00—International Casino Party, jointly with ASRE and NWAH & ACA

January 26—Wednesday

a.m. 9:30—Studies on Bacterial Control in Air Conditioning, T. S. Carswell, J. D. Fleming, and H. K. Nason
Physiologic Response of Man to Environmental Temperature, Dr. F. K. Hick, Dr. R. W. Keeton, and Nathaniel Glickman
Control of Body Heat Loss Through Radiant Means, Dr. C. A. Mills and Dr. Cordelia Ogle

p.m. 2:00—Joint Session with American Society of Refrigerating Engineers
Control of Air Conditioning in Large, Medium, and Small Buildings, W. E. Zieber and S. F. Nichol
Physiological Reactions and Sensations of Comfort Under Various Atmospheric Conditions, Dr. C.-E. A. Winslow, L. P. Herrington, and A. P. Gagge
Performance Tests of Asbestos Insulating Air Duct, R. H. Heilman and R. A. MacArthur
6:30—Past Presidents' Dinner

January 27—Thursday

a.m. 9:30—Effects of Artificial Lighting on Air Conditioning, Walter Sturrock
Comparative Analysis of Office Building Air Conditioning Systems, J. R. Hertzler
Ventilating the Lincoln Vehicular Tunnel, C. W. Murdock

p.m. 2:00—Inspection Trip Lincoln Vehicular Tunnel
Inspection Trip Beechnut Plant
7:00—Annual Banquet

January 28—Friday

a.m. 9:30—Draft Temperatures and Velocities in Relation to Skin Temperature and Feeling of Warmth. F. C. Houghten, Carl Gutberlet. Edward Witkowski
Study of Methods of Control and Types of Registers as Affecting Temperature Variations in the Research Residence, A. P. Kratz and S. Konzo
Summer Cooling Requirements of 275 Workers in an Air Conditioned Office. A. B. Newton, F. C. Houghten, Carl Gutberlet, and R. W. Qualley

to save the consumer 25% on his fuel bills will be viewed. Automatic draft regulators protect the oil-fired equipment against back drafts, a provision that is important to the economical operation of heaters using range burners.

Controls and Instruments

Among the many air conditioning control devices on display will be a three-point micro-balanced controller which provides for control of such factors as inside temperature, outside recording and radiator output temperature, thus preventing overshooting and undershooting. "Seasonal" control will be the subject of another exhibit in which will be demonstrated the automatic shifting from "heating" to "ventilating" and finally to "cooling" as the outside temperature rises. Among other devices will be a differential thermostat which will maintain any desired temperature relationship between two points such as "outdoors" and "conditioned space."

Among the many exact temperature and humidity control instruments on display will be a device which regulates the heating or cooling equipment in terms of body sensitivity rather than in terms of some arbitrary standard. Another device, it is claimed, will control relative humidity to within plus or minus ½ of 1%.

Hundreds of other control instruments of interest in the heating and air conditioning fields will be seen. These will include equipment to prevent the formation of condensation or frost on windows during cold weather, a system for the remote transmission of records in terms of percentage relative humidity, a heat control that looks like a radio with "weather-tuning" knobs, a field barometric draft control that limits the draft at the point of best efficiency, surface pyrometers for checking insulation losses, a compact and inexpensive magnetic gas valve which operates on the new "floating disc" principle, and a full line of snap-acting controls which are unaffected by vibration or motion.

Among the various types of valves that function importantly in the air conditioning field is a new thermostatic valve which is designed for small cabinet and case goods and which is practically free of friction. Its construction prevents overloading of the compressor motor during the starting period when the evaporator is warm. Also shown in the same exhibit will be a solenoid refrigerant valve in which the complete needle and seat assembly feature can be removed for inspection or cleaning without removing the valve.

Another exhibitor will show a unit pump that incorporates in one assembly a pump, pressure regulating and bypass valve, nozzle cut-off valve and strainer. Part of the same exhibit will be devoted to a new type of nozzle which is particularly adaptable for use on water or oil at pressures up to 250 lb.

A new stoker stand-by time relay with a thermostatic night turn-down will be shown. This apparatus makes it unnecessary to install two separate electric clock mechanisms on stoker-fired heating systems where automatic day and night room temperatures are desired. In another exhibit thermostatic refrigerant control valves, electric floating switches and magnetic stop valves will be seen. A manufacturer of thermostats and other automatic controls will feature a new, compact and inexpensive year-round hot water supply control used with steam, vapor and hot water systems employing indirect hot water heaters. Another exhibitor will display what he claims to be the smallest float and thermostatic trap on the market. It is designed to facilitate piping connections where space is limited.

Pipe fittings of various makes will be shown in connection with control valves. One exhibit will draw attention to a new method of installing piping conduction systems of non-rusting, non-clogging hard wall copper pipe without resorting to the greatly increased pipe wall thickness necessary for threading. Another maker of pipe fittings which eliminate threading will show how his piping can be installed easily, quickly and permanently by unskilled labor.

A wide assortment of fans and blowers to meet the diverse requirements met with in the air conditioning industry will merit close inspection. As a means toward preventing the accumulation of heat in the upper parts of the building, one system provides for superimposing a cold stream of air upon the warm streams issuing from the unit. At another exhibit an aluminum blower wheel will be displayed which is said to be rigid in comparison to its weight.

Included in other exhibits will be a new type of limit load blower with direct connected motor and floated drive, providing sound isolation; a marine blower designed for compactness and having watertight motors; and attic and window ventilators of new design.

Grilles which provide for adjustment so that by turning one bar the entire 2-in. section is turned will be displayed. The close spacing of bars provides concealment of the duct, and the round edges of the bars reduce the noise and resistance to a minimum.

Metal fabricated filters of clean, compact, patented construction for industrial application will be featured by another manufacturer. These filters are obtainable in various sizes for internal combustion engines, air compressors, blowers and air conditioning systems. Air cleaning efficiency is claimed to be better than 99% and the resistance less than ⅛ in. of water column. A different exhibitor of automatic, dry and viscous types of filters will display a product based upon the principle of electric precipitation for efficient air cleaning.

Thermal insulation materials will be the subject of another part of the Exposition. One manufacturer of rock wool products will carry a full display for industrial application. On exhibit will be a new plastic material of especially high coverage and efficiency that is suitable for use up to 300F.

An asbestos product for use on air conditioning ducts is claimed by its maker to be approximately 30% more efficient than the ordinary aircell type of insulation. In the same section, refractory cements and furnace and boiler insulation will be available for inspection. A strong, uniform refractory cement will be featured for application on automatic stokers. It is said to be very durable and can be cast into any shape or size.

Electric motors emphasizing quietness of operation will be shown. V-belts which are made entirely of synthetic rubber will be on display.

This Exposition will be under the direction of Charles F. Roth, President of the International Exposition Company, also director of previous shows.

Published by HEATING & VENTILATING, 148 Lafayette St., New York

SIZING REFRIGERATION PIPING FOR AIR CONDITIONING

Liquid Lines

REFRIGERANT PIPING SIZES FOR LIQUID LINES

Nominal Type Size (Inches) Tube O.D. ⅛ In. Larger	Ammonia NH_3 Sp. Gr. = 0.68			Carbon Dioxide CO_2 Sp. Gr. = 0.99			F12 CCl_2F_2 Sp. Gr. = 1.44			Methyl Chloride CH_3Cl Sp. Gr. = 0.99			Sulphur Dioxide SO_2 Sp. Gr. = 1.46		
	Cooling Load		Wt., Lb. per 100 Lin. Ft.	Cooling Load		Wt., Lb. per 100 Lin. Ft.	Cooling Load		Wt., Lb. per 100 Lin. Ft.	Cooling Load		Wt., Lb. per 100 Lin. Ft.	Cooling Load		Wt., Lb. per 100 Lin. Ft.
	B.t.u. per Hr.	Tons		B.t.u. per Hr.	Tons		B.t.u. per Hr.	Tons		B.t.u. per Hr.	Tons		B.t.u. per Hr.	Tons	
⅛	—	—	—	—	—	—	6,000	0.5	—	7,200	0.6	—	8,400	0.7	—
¼	—	—	—	—	—	—	18,000	1.5	3	48,000	4	2	54,000	4.5	3
⅜	180,000	15	3	—	—	—	36,000	3	6	84,000	7	5	96,000	8	7
½	360,000	30	5	240,000	20	5	60,000	5	11	144,000	12	8	168,000	14	12
¾	720,000	60	12	600,000	50	12	120,000	10	24	300,000	25	18	336,000	28	26
1	1,200,000	100	21	900,000	75	21	216,000	18	43	528,000	44	31	600,000	50	46
1¼	2,040,000	170	32	1,320,000	110	32	336,000	28	69	840,000	70	48	960,000	80	72
1½	3,168,000	264	46	1,920,000	160	46	480,000	40	97	1,200,000	100	69	1,344,000	112	104
2	5,052,000	421	82	3,600,000	300	82	840,000	70	172	2,100,000	175	121	2,352,000	196	184
2½	8,160,000	680	128	5,160,000	430	128	1,344,000	112	256	3,360,000	280	192	3,840,000	320	288
3															
4															
Max. Velocity	225 F.P.M			225 F.P.M.			150 F.P.M.			180 F.P.M.			150 F.P.M.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

NOTE:—Lines ¾" and Less:—Under 25 lin. ft. as tabulated; 26 to 75 lin. ft. use one size larger; 76 to 150 lin. ft. use two sizes larger.

Lines 1" to 2" Inclusive:—Under 50 lin. ft. as tabulated; 51 to 100 lin. ft. use one size larger; 101 to 200 lin. ft. use two sizes larger.

Lines 2½" and Over:—Under 100 lin. ft. as tabulated; 101 to 200 lin. ft. use one size larger; 201 to 300 lin. ft. use two sizes larger.

Copyright, 1938, by The Industrial Press

SIZING REFRIGERATION PIPING FOR AIR CONDITIONING

Liquid Lines

In selecting pipe sizes for refrigerant lines it is important to keep in mind two points—first that pipe sizes should be kept large to reduce friction losses, and second that they should not be made too large because a low refrigerant velocity will prevent the circulation of the oil. With some refrigerants now commonly used for air conditioning a lubricant is carried around with the refrigerant and if the speed is reduced too much the lubricant will not circulate, bringing about operating difficulties.

The table on the other side of this sheet gives refrigerant pipe sizes for the liquid line between the outlet of the receiver and the expansion valve. This table is arranged in a form similar to that commonly used for presenting tables for sizing steam and hot water piping. Opposite a column of standard pipe sizes appear figures giving the heat load in B.t.u. per hour suitable for each pipe size for the refrigerant used.

It will be noted also that in the table the column listing pipe sizes refers to the "nominal" pipe size. This is the name by which the sizes are designated by most engineers and contractors in the course of ordinary usage. Tubing is commonly ⅛ in. larger in outside diameter than its "nominal" size, while iron and steel standard weight pipe has outside diameters which bear no steady relation to the nominal size. Use of this method of listing the standard pipe sizes permits applying the tables regardless of whether tubing or pipe is being used.

Since the number of turns, obstructions, or fittings affect the size selection, it is necessary to make allowances for their presence. Their number and their effect on the size vary with each installation. A workable single table is one which will prevent excessive pressure drop when allowance is made for a reasonable number of fittings and bends. This allowance has been made in computing the table. Consequently, no additional allowance is necessary unless the number of fittings is excessive, in which case their presence can be compensated for by selecting the next standard pipe size larger than would normally be used. This general procedure insures adequate pipe size and in cases where conditions permit lines straight and short, the ideal of no measurable friction loss in the piping may be approached. The only element of individual judgment is the question of when the number of fittings and turns is really excessive. There is no direct answer to this, but experience and exercise of reasonable judgment will keep errors to a minimum. Keep in mind that the general rule is that it is probably better to err on the side of too large a pipe size rather than too small a size.

Provision is also made in the table for a reasonable method of compensating for excessive lengths of pipe line. In the table footnotes indicate the length of pipe for which the tabulated values should be used and the points where extra allowances should be made. The maximum velocities assumed as allowable in computing the tables are shown.

The capacities of the pipes are given in B.t.u. per hour and also in tons of refrigeration effect since refrigeration loads are so frequently stated in tons instead of in heat units per hour. The right-hand column under each refrigerant shows the weight of liquid refrigerant contained in each 100 lin. ft. of liquid line. This information is frequently desired when determining the amount of refrigerant necessary to charge the system.

Use of the table is illustrated in the following examples:

Example 1. A methyl chloride refrigerating system for handling an air conditioning load of 40,000 B.t.u. per hr. has a liquid line 61 ft. long. What nominal pipe size should be used?

Solution. Refer to table and note that the solution will be found in column 11 under Methyl Chloride. Move down column 11 until a figure equal to or greater than 40,000 is reached, which in this case is 48,000. Move horizontally to column 1 and note that a ¼-in. pipe would be indicated. Refer to the footnote on table and observe that for lines ¾ in. and smaller the tabular figures apply for lines under 25 ft. long. Since this line is 61 ft. long the note states that the pipe size should be one size larger than indicated in the table. Therefore, select the pipe size as ⅜ in. instead of ¼ in.

Example 2. A refrigerating system using F12 and operating on an air conditioning load of 40 tons has a liquid line 181 ft. long. What pipe size would be selected?

Solution. Refer to table and note that column 9 is the one where the solution will be found. Move down the column until a figure equal to or greater than 40 is found. In this case the exact figure 40 is reached. Move horizontally to column 1 and find that a 1½-in. pipe is indicated. Refer to the footnote under table and observe that an allowance of two pipe sizes over that shown in the table should be made because of the excessive length of the liquid line. Therefore, a 2½-in. pipe size is selected.

Example 3. How many pounds of F12 would be required to fill the liquid line selected for Example 2?

Solution. Refer to table and note that column 10 contains the solution. The pipe line is 181 ft. long, or 1.81 hundred feet. Move down column 10 until opposite the 2½-in. pipe size and read 256 as the pounds of F12 required per 100 ft. of pipe. Therefore, the line will hold 256 x 1.81, or 463.6 lb. of F12.

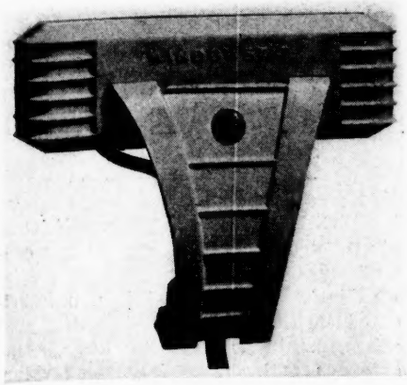
Information on the sizing of vapor suction lines is given on H. & V.'s Reference Data 115 and 116.

Published by Heating & Ventilating, *148 Lafayette St., New York*

Copyright, 1938, by The Industrial Press

NEW EQUIPMENT

In writing to HEATING & VENTILATING for additional information mention the H. & V. Item Number

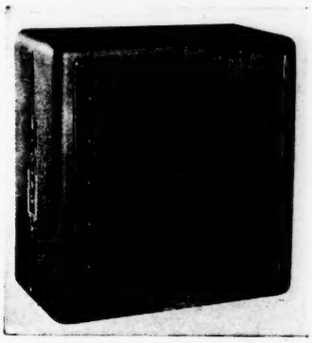


Friez Windowstat

NAME—Friez Windowstat.
PURPOSE—To prevent condensation of moisture on windows.
FEATURES—Research at the laboratories of the Friez Company has established that as approach is made to cold surfaces, such as windows in winter weather, the relative humidity of the air rises rapidly, until finally 100% relative humidity is reached at the window itself and then condensation occurs at that point. By placing a specially constructed humidity sensitive instrument (incorporating Friez multiple human hair element) in close proximity to the chilled surface and at the point where its sensitive element is able to detect a dangerously high condition, warning is given of the approach of a condition of condensation. The Windowstat then provides a means of overruling the room humidistat and shutting down the humidifier until such time as further humidity can be added without further condensation occurring. In this way the highest possible relative humidity is maintained without condensation actually occurring on the windows.
MADE BY—*Julien P. Friez & Sons, Inc., Baltimore, Md.*
H. & V. ITEM NO. 18A

Young Unit Heaters

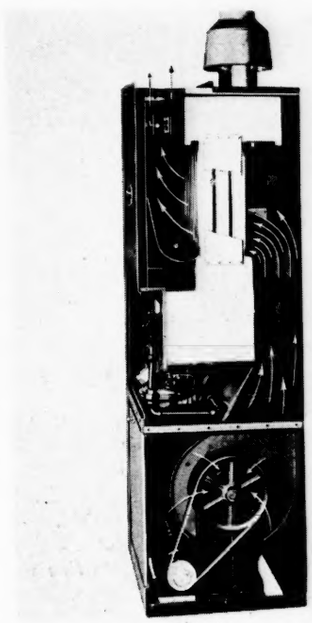
NAME—Young unit heaters.
PURPOSE—For space heating.
FEATURES—Numerous changes have been made in the new line of Young unit heaters. The steel casing is now made in one piece of welded construction to minimize vibration and eliminate rattles. The units are finished in a deep brown crackle trimmed in chrome. The core depth has been increased 33 1/3% over corresponding models of last year and a more liberal fin spacing gives a larger volume of air at lower temperature. Entire heating unit motor and fan is assembled separate and insulated from the casing to overcome all motor vibrations and expansion and contraction stresses.

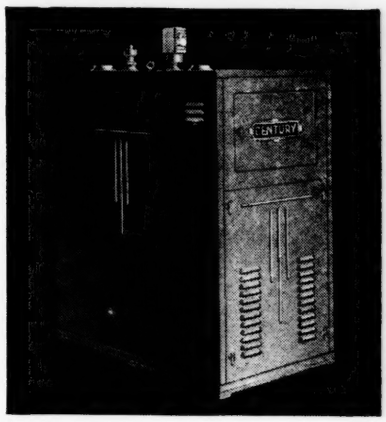


SIZES AVAILABLE—Twenty-four single units and four twin units ranging in capacities from 18,000 to 658,000 B.t.u. per hr.
MADE BY—*Young Radiator Co., Racine, Wis.*
H. & V. ITEM NO. 18B

Bryant Forced Warm Air Heater

NAME AND MODEL NUMBER—Bryant VB-8 forced air gas heater.
PURPOSE—A compact gas heater for supplying forced warm air.
FEATURES—Heater may be placed wherever space is available, in a corner of a room, in the basement, or in a closet. When it is placed on the same level as the heated space, the unit is installed right over the return air duct. Heater requires 4 sq. ft. of floor space. Air enters through the bottom of the unit and then is drawn into a blower. Baffles then guide it through a chrome-alloy heat-exchanger. Warm air is discharged to a duct at the top.
CAPACITY—75,000 B.t.u. per hr.
MADE BY—*The Bryant Heater Co., Cleveland, Ohio.*
H. & V. ITEM NO. 18C



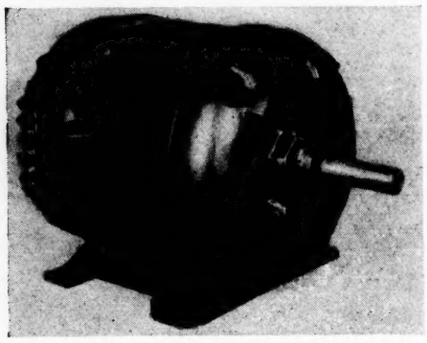


Century Boiler-Burner Unit

NAME—Century flueless boiler-burner.
PURPOSE—For supplying steam or hot water utilizing oil as a fuel.
FEATURES—This boiler is basically a flueless type consisting of a rolled inner and outer shell containing stamped heads and a center passage all electrically welded together. This constitutes the boiler proper which is then enclosed in a double insulated casing which directs the gases over the outer shell surface after primary combustion has taken place inside the unit. The combination of two materials, known as Super X and Rock Wool, is used to prevent heat loss from the boiler. The manufacturer states that the heating surface per gallon of water in the boiler is extremely large. The boiler is said to be capable of heating water from 60 to 212F in 10 min. Oil burner is the new model K type and is designed especially for this unit.
SIZES AND CAPACITIES—Two models with net steam load of 403 and 806 sq. ft., respectively.
MADE BY—*Century Engineering Corp., 213-17 4th Ave., Cedar Rapids, Iowa.*
H. & V. ITEM NO. 18D

Cutler-Hammer Starters

NAME—Across-the-line starter NEMA size 0.
PURPOSE—For use with polyphase squirrel-cage motors driving fans, pumps, and like equipment.
FEATURES—Among the features of this starter are pushbutton operation, positive quick make and break (twin break) mechanism, silver-to-silver contacts, three- and four-pole construction, thermal overload protection, free tripping type, and rubber-mounted operating mechanism. The starter is so constructed that it can be removed without disturbing the conduit.
SIZES AVAILABLE—Up to 2 hp., 550 volts.
MADE BY—*Cutler-Hammer, Inc., 247 N. 12 St., Milwaukee, Wis.*
H. & V. ITEM NO. 18E

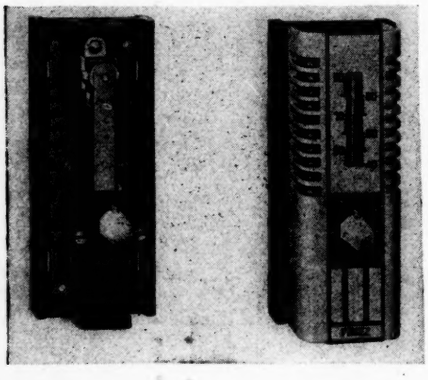


Wagner Motors

NAME—Integral-horsepower type RG repulsion-induction motors.
PURPOSE—For operating refrigerant compressors, air compressors, viscous liquid pumps, and like machinery.
FEATURES—The salient characteristics of the Wagner type RG repulsion-induction motor are said to be: (1) high starting torque; (2) low starting current; (3) positive starting on low voltage; (4) high power-factor, and (5) high efficiency. The ventilating openings are provided in the endplates and are located and protected so that falling objects cannot get into the motor. Endplate bolt holes are evenly spaced permitting 180° rotation of endplates for wall and ceiling mounting.
SIZES AVAILABLE—1 to 3 hp.
MADE BY—*Wagner Electric Corp., St. Louis, Mo.*
H. & V. ITEM NO. 18F

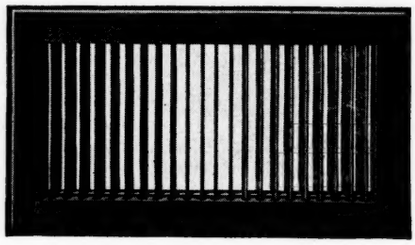
Friez Thermostat

NAME—Microstat.
PURPOSE—A temperature control with an exceptionally small differential control for heating or cooling equipment.
FEATURES—Instrument is designed especially for use on low voltages (25 volts) yet is able to carry an electrical load of 75 watts without the use of relays. A new "Alnico" sintered magnet of high strength and permanency is used in this thermostat. Silver snap-acting contacts, heat treated and seasoned bimetallic elements, are used in the construction of these instruments. Cases of pressed metal with a standard ivory or silver finish with a plastic base. Built-in thermometer is included. Dimensions are 3½ in. high x 1½ in. wide x 1½ in. deep. Standard range 45 to 90F; special ranges available.
LITERATURE AVAILABLE—Bulletin TM.
MADE BY—*Julien P. Friez & Sons, Inc., Baltimore, Md.*
H. & V. ITEM NO. 18G



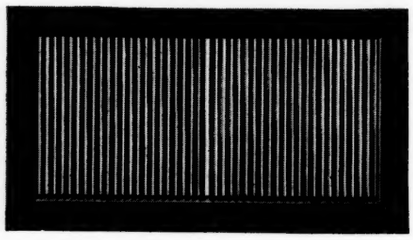
Auer Registers

NAME—Auer Dura-Flo and Fin-Flo.
PURPOSE—For use with warm air heating or air conditioning systems.



Auer Dura-Flo register

FEATURES—The Dura-Flo register is of the wall type and has a straight bar face with fixed bars either set for one direction or multi-directional. The frame is braced and welded and bars are mortised and locked into it. The Fin-Flow register is of fin-type design

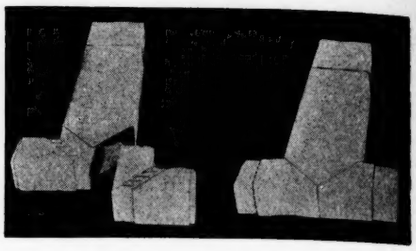


Auer Fin-Flo register

with thin blades which are fixed at the factory. They are set in any directional grouping. This register is intended especially for forced air systems of heating or cooling. The fin blades are locked into the frame.
SIZES—Both registers are available in all standard sizes and finishes.
MADE BY—*Auer Register Co., 3608 Payne Ave., Cleveland.*
H. & V. ITEM NO. 18H

Radiator Heating Guide

NAME—Radiator heating guide.
PURPOSE—For rapid determination of the amount of installed radiator surface without reference to manufacturers' data or handbooks.
FEATURES—The total radiator surface in any given radiator can be figured (after the number of columns, height, and sections are determined) by a manipulation of the slide. All types of radiation are included.
MADE BY—*Calculator Specialties Co., 122 S. Michigan Ave., Chicago.*
H. & V. ITEM NO. 18I

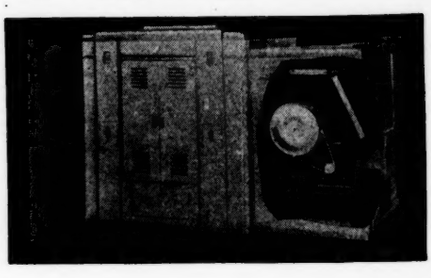


Carey Asbestos Duct

NAME—Careyduct.
PURPOSE—To distribute conditioned air throughout a building using a central conditioning unit.
FEATURES—Careyduct is a prefabricated insulated duct made entirely of asbestos. It is said to have great strength and a high insulating value. Because of its design, it is a simple matter to make fittings, and is easy to erect. Friction factor is comparable to that of metal duct. Noises emanating from mechanical equipment are said to be materially reduced by this material.
MADE BY—*The Philip Carey Co., Lockland, Cincinnati, Ohio.*
H. & V. ITEM NO. 18J

Sunbeam Air Conditioner

NAME AND MODEL NUMBER—Sunbeam Series S air conditioner.
PURPOSE—A stoker-fired conditioner for winter air conditioning.
FEATURES—Unit is designed for hopper and bin-feed stokers. The heating element is provided with openings so that no cutting is required to install the stoker from the front, rear, or either side. Special model is available for installation of stoker below floor level. A large double radiator is said to accommodate an unusually large accumulation of fly ash without reducing the rated heating capacity of the unit. Under average conditions and with the use of certain grades of coal, it is said that fly ash need not be removed even once during the heating season. A clinker compartment is located between the front casting and firepot. As the clinkers are removed from the fire bed they are dropped into the clinker pan which is located in this compartment and which can be removed and emptied after clinkers have cooled and odorous gases have passed out the flue.
SIZES AND CAPACITIES—Two sizes with ratings of 150,000 and 200,000 B.t.u. capacity at the register.
MADE BY—*The Fox Furnace Co., Elyria, Ohio.*
H. & V. ITEM NO. 18K



Degree-Day Figures for November, 1937

HEATING & VENTILATING continues its tenth year of publishing degree-day data for various large cities

	Albany, N. Y.	Atlanta, Ga.	Baltimore, Md.	Birmingham, Ala.	Boston, Mass.	Buffalo, N. Y.	Burlington, Vt.
Degree-days for November, 1937	698	502	519	449	631	768	818
Degree-days, Sept. 1, 1937 to Nov. 30, '37	1297	749	863	642	1146	1477	1589
Degree-days, Sept. 1, 1936 to Nov. 30, '36	1352	544	810	491	1229	1446	1762
Degree-days, Sept. 1, to Nov. 30, Normal	1292	492	790	318	1104	1268	1486

	Cheyenne, Wyo.	Chicago, Ill.	Cincinnati, Ohio	Cleveland, Ohio	Columbus, Ohio	Denver, Colo.	Des Moines, Iowa
Degree-days for November, 1937	929	825	704	729	743	733	895
Degree-days, Sept. 1, 1937 to Nov. 30, '37	1597	1388	1183	1316	1264	1150	1408
Degree-days, Sept. 1, 1936 to Nov. 30, '36	1735	1241	1081	1207	1159	1316	1314
Degree-days, Sept. 1, to Nov. 30, Normal	1745	1112	863	1125	1003	1259	1155

	Detroit, Mich.	Dodge City, Kan.	Duluth, Minn.	El Paso, Tex.	Erie, Pa.	Evansville, Ind.	Fort Wayne, Ind.
Degree-days for November, 1937	798	708	1120	297	744	629	838
Degree-days, Sept. 1, 1937 to Nov. 30, '37	1495	1007	2147	338	1378	975	1466
Degree-days, Sept. 1, 1936 to Nov. 30, '36	1420	1103	2261	581	1272	907	1301
Degree-days, Sept. 1, to Nov. 30, Normal	1219	948	1943	421	1125	683	1082

	Fort Worth, Tex.	Grand Rapids, Mich.	Green Bay, Wis.	Harrisburg, Pa.	Hartford, Conn.	Indianapolis, Ind.	Ithaca, N. Y.
Degree-days for November, 1937	394	814	950	641	666	769	748
Degree-days, Sept. 1, 1937 to Nov. 30, '37	473	1484	1746	1138	1243	1276	1491
Degree-days, Sept. 1, 1936 to Nov. 30, '36	570	1443	1724	1077	1255	1129	1481
Degree-days, Sept. 1, to Nov. 30, Normal	252	1250	1558	989	1097	985	1325

	Kansas City, Mo.	Knoxville, Tenn.	La Crosse, Wis.	Lansing, Mich.	Lincoln, Neb.	Little Rock, Ark.	Los Angeles, Calif.
Degree-days for November, 1937	761	594	961	854	808	494	106
Degree-days, Sept. 1, 1937 to Nov. 30, '37	1086	899	1657	1650	1224	692	125
Degree-days, Sept. 1, 1936 to Nov. 30, '36	1001	680	1618	1616	1189	620	62
Degree-days, Sept. 1, to Nov. 30, Normal	826	702	1467	1456	1069	428	123

	Louisville, Ky.	Madison, Wis.	Memphis, Tenn.	Milwaukee, Wis.	Minneapolis, Minn.	Nashville, Tenn.	New Haven, Conn.
Degree-days for November, 1937	652	963	477	875	994	564	626
Degree-days, Sept. 1, 1937 to Nov. 30, '37	1043	1657	700	1525	1731	858	1149
Degree-days, Sept. 1, 1936 to Nov. 30, '36	954	1600	651	1447	1715	749	1153
Degree-days, Sept. 1, to Nov. 30, Normal	738	1437	464	1380	1537	619	1092

	New Orleans, La.	New York, N. Y.	Norfolk, Va.	Oklahoma City, Okla.	Omaha, Neb.	Peoria, Ill.	Philadelphia, Pa.
Degree-days for November, 1937	246	581	414	581	868	852	562
Degree-days, Sept. 1, 1937 to Nov. 30, '37	287	1000	639	768	1326	1394	954
Degree-days, Sept. 1, 1936 to Nov. 30, '36	190	988	544	803	1292	1224	904
Degree-days, Sept. 1, to Nov. 30, Normal	102	894	510	564	1109	1173	830

	Pittsburgh, Pa.	Portland, Me.	Portland, Oreg.	Providence, R. I.	Reading, Pa.	Reno, Nev.	Richmond, Va.
Degree-days for November, 1937	689	737	458	639	605	599	515
Degree-days, Sept. 1, 1937 to Nov. 30, '37	1233	1398	733	1183	1064	1011	871
Degree-days, Sept. 1, 1936 to Nov. 30, '36	1079	1510	882	1225	1044	1174	699
Degree-days, Sept. 1, to Nov. 30, Normal	982	1343	995	1103	1013	1311	641

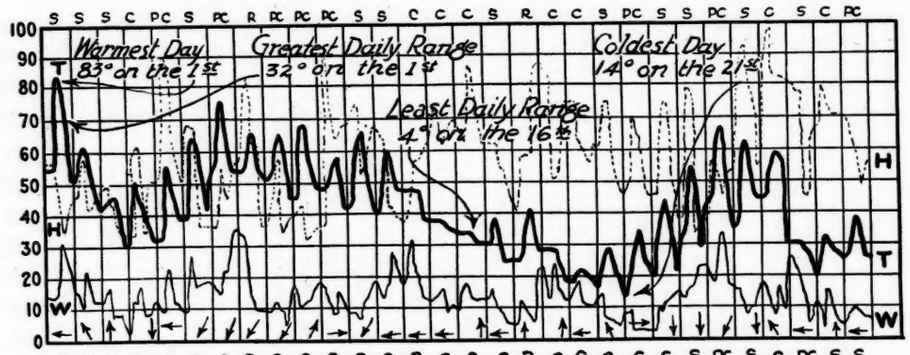
	Rochester, N. Y.	St. Louis, Mo.	Salt Lake City, Utah	San Francisco, Calif.	Scranton, Pa.	Seattle, Wash.	Spokane, Wash.
Degree-days for November, 1937	747	689	575	203	707	488	738
Degree-days, Sept. 1, 1937 to Nov. 30, '37	1454	1025	908	429	1339	882	1262
Degree-days, Sept. 1, 1936 to Nov. 30, '36	1411	909	1256	425	1305	1012	1566
Degree-days, Sept. 1, to Nov. 30, Normal	1289	802	1129	521	1189	1165	1526

	Springfield, Ill.	Syracuse, N. Y.	Toledo, Ohio	Trenton, N. J.	Utica, N. Y.	Washington, D. C.	Wichita, Kan.
Degree-days for November, 1937	788	704	782	608	768	550	693
Degree-days, Sept. 1, 1937 to Nov. 30, '37	1226	1362	1423	1067	1453	941	972
Degree-days, Sept. 1, 1936 to Nov. 30, '36	1080	1370	1314	1050	1425	937	955
Degree-days, Sept. 1, to Nov. 30, Normal	963	1319	1110	830	1393	845	828

Methods of applying the degree-day in connection with the operation of heating plants or for the prediction of fuel consumption of heating plants are described fully in the DEGREE-DAY HANDBOOK, published in 1937, by HEATING & VENTILATING, 148 Lafayette Street, New York, price $3. Degree-days as given above for a "normal" month or season are based on averages for a long period of years, ending about 1922. Averages covering different periods will disagree with the above figures slightly.

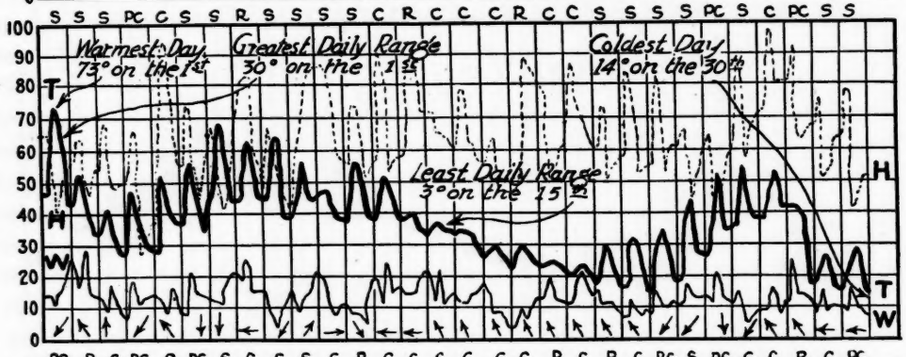
THE WEATHER FOR NOVEMBER, 1937

Plotted from records compiled for HEATING & VENTILATING by the U. S. Weather Bureau. Heavy curves (T), dry bulb temperatures in deg. F.; dotted lines (H), per cent relative humidity from readings at 8 a.m., noon, and 8 p.m. Light lines (W), wind velocity in m.p.h. Arrows indicate wind direction at maximum velocity, north being arrow pointing up, etc.; S—clear; PC—partly cloudy; C—cloudy; R—rain; Sn—snow.



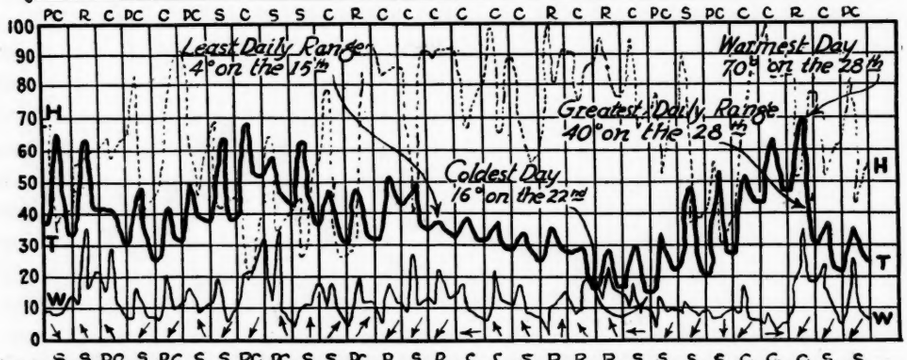
St. Louis

Mean temp. for month, 42.1F; aver. wind velocity, 12.4 m.p.h.; prevailing direction of wind, W.



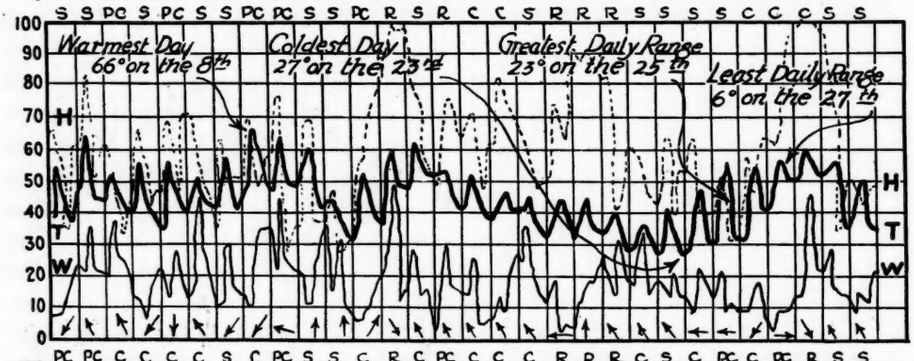
Chicago

Mean temp. for month, 37.4F; aver. wind velocity, 12.2 m.p.h.; prevailing direction of wind, SW.



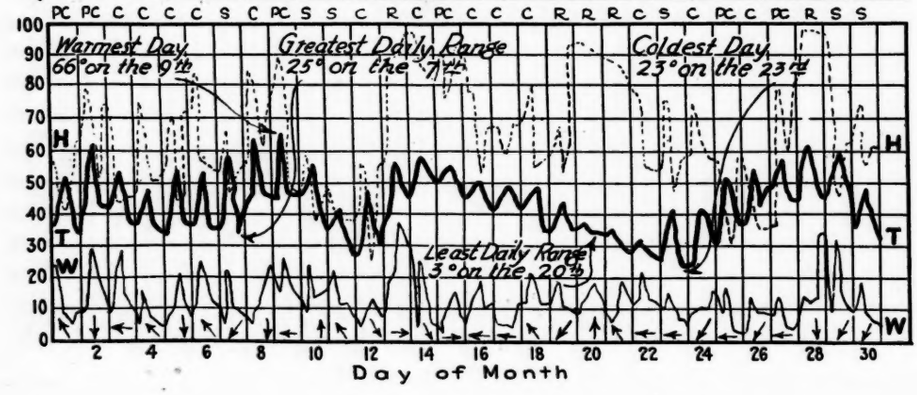
Pittsburgh

Mean temp. for month, 39.4F; aver. wind velocity, 11.7 m.p.h.; prevailing direction of wind, SW.



New York

Mean temp. for month, 45.6F; aver. wind velocity, 16.2 m.p.h.; prevailing direction of wind, NW.


Warmest Day
66° on the 9th
Greatest Daily Range
25° on the 7th
Coldest Day
23° on the 23rd
Least Daily Range
3° on the 20th
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
Day of Month

Boston

Mean temp. for month, 44.0F; aver. wind velocity, 11.4 m.p.h.; prevailing direction of wind, W.

WITH THE MANUFACTURERS

Anthracite Industries, Inc., New York, announces that *G. Gordon Cook* has been elected secretary and treasurer by the board of directors. *George W. Barnes* was elected to the offices of secretary and assistant treasurer at the same time.

Consolidated Air Conditioning Corp., New York, has appointed *Arthur S. Leitch Co., Ltd.*, 148 Harrison St., Toronto, to manufacture its line of odor absorbers in Canada.

The Emerson Electric Mfg. Co., St. Louis, Mo., held its annual fan sales division conference the week of November 22. Attended by the sales, advertising, and fan engineering staff of the home office and the territorial fan sales organization, new fan models were demonstrated and complete sales and merchandising plans for 1938 discussed.

The Insulite Co., Minneapolis, Minn., has elected *E. H. Batchelder, Jr.*, senior vice-president. *E. W. Morrill*, has been named general sales manager. Two executive sales positions have been created, with headquarters in Chicago—*M. G. Jensen* has been appointed general merchandising manager handling solicitation and promotion; *M. C. Juell* executive assistant guiding executive matters relating to market and field activities.

Kelvinator Div., Nash-Kelvinator Corp., Detroit, announces that *J. A. Lee* has become a member of its commercial air conditioning department and is stationed at the home office in Detroit. Mr. Lee was formerly sales manager for one of the company's southern distributors. *John Boyd, Walter M. Porosky*, and *John H. Caron* have been added to the company's advertising and sales promotion staff.

Lee B. Mettler Co., Los Angeles, Calif., has named *James M. Kobabe* executive general manager. For the past 11 years Mr. Kobabe was affiliated with Mettler as a direct factory engineer, with a general distributorship of the company's products in the central states. His company, the James M. Kobabe Co., is located in Chicago, and Mr. Kobabe will now be located in Los Angeles, dividing his time with the Chicago office and other offices.

National Radiator Corp., Johnstown, Pa., has elected *C. Lawrence Evans* treasurer of the corporation. Mr. Evans was formerly chairman of the board of directors of Hiram Swank's Sons, refractories manufacturers.

Perfex Controls Co., Milwaukee, Wis., announces that *D. G. (Jerry) Spahr* has joined the organization with headquarters in Columbus. He will cover the territory adjacent to Columbus and also act as factory sales representative in other sections of the country for Perfex.

Pernot and Rich, Inc., 2526-46 San Fernando Road, Los Angeles, Calif., has appointed *Alonso Aviles* of Nogales, Sonora, Mexico, distributor of its line on the west coast of Mexico.

Pleasantaire Corp., has opened new executive offices at 1623 Connecticut Ave., Washington, D. C.

Rodman Engineering Co., Buffalo, N. Y., manufacturers' representatives, has been formed to carry on the business of Hoesel, Ruff & Rodman Co., recently dissolved. *Murton J. Rodman* is a continuing partner and *Charles Adelmann* is a new partner.

Specialty Converters, Inc., East Braintree, Mass., has acquired the Silvercote line of insulation products. The company takes over the Silvercote manufacturing operations in Kalamazoo, the general sales office at 161 E. Erie St., Chicago, and the entire Silvercote organization. *C. E. Stedman*, founder and originator of Silvercote and that company's president, has been named vice-president in charge of sales and advertising.

The Trane Co., La Crosse, Wis., has established a new transportation department at 852 N. Rush St., Chicago. *Jim Whalen*, formerly of the company's Chicago branch, and *Jerry Hicks*, of the La Crosse air conditioning department, are in charge. This department will handle all problems and sales activities relating to railroad, bus and van air conditioning.

Utilities Engineering Institute, New York and Chicago, has appointed *George D. Doherty* industrial relations manager.

Walton Laboratories, Inc., has opened a new plant in Utica, N. Y., for the manufacture and distribution of its Walton humidifier. The company will produce the humidifier formerly manufactured by the American Gas Accumulator Co., Elizabeth, N. J. In addition to humidifiers the company will manufacture special units for air medication, deodorization, and special machines for the mechanical nebulization of liquids.

York Ice Machinery Corp., York, Pa., has named *John R. Hertzler* general representative in refrigeration and air conditioning. He was formerly manager of the air conditioning division, which position will now be occupied by *Willis E. Barnum*, formerly of the Los Angeles branch office.

COMING EVENTS

JANUARY 24-26, 1938. Winter Convention, National Warm Air Heating and Air Conditioning Association, Hotel Roosevelt, New York.

JANUARY 24-28, 1938. 5th International Heating and Ventilating Exposition, Grand Central Palace, New York. Charles F. Roth, Grand Central Palace, New York.

JANUARY 24-28, 1938. 44th Annual Meeting, American Society of Heating and Ventilating Engineers, New York.

JANUARY 25-27, 1938. 33rd Annual Meeting, American Society of Refrigerating Engineers, Hotel Roosevelt, New York.

APRIL 11-16, 1938. Mechanical Equipment Show, Textile Hall, Greenville, S. Car. William G. Sirrine, President, Textile Hall Corp., Greenville, S. Car.

MAY 31-JUNE 2, 1938. Annual Convention, Heating, Piping and Air Conditioning Contractors National Association, Boston, Mass.

DECEMBER 5-10, 1938. 13th National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York.